International Technical Support Organization

Lotus Domino for AS/400 R4.6: Installation, Customization and Administration

November 1998

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Before using this information and the product it supports, be sure to read the general information in the Special Notices section at the back of this book.

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This edition applies to Lotus Domino for AS/400 Release 4.6.2

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Preface

This redpaper describes Domino for AS/400 4.6. It provides information on how to install, configure, and use the product in a number of different environments.

Specifically, this redpaper introduces you to Domino for AS/400 and guides you through the installation and configuration process, step-by-step. It also helps you prepare a backup and recovery plan for saving and restoring Domino data on the AS/400 system. In addition, this redpaper describes mail integration, directory synchronization, alternatives to configuring and managing, and dial-up connectivity as they relate to Domino for AS/400.

The redpaper was written for technical specialists and programmers, who are IBM customers and business partners. It also serves as an education tool for the general IBM and Lotus community. By reading this redpaper, you are sure to obtain a solid technical understanding of how to deploy Domino for AS/400.

Summary of Changes for the Second Edition

The following changes and additions have been made for the second edition of this redpaper:

Chapter 2:

On page 39: The PTF providing the EDTF command for V4R3 is SF49052.

On page 52: Tips on problems with the LODRUN command.

On page 77: Ending the Domino Server

On page 104: Corrected mistake in example to setup loopback.

On page 105: A new tip on correctly setting up for server replication.

On page 125: Install a New Version of Lotus Domino for AS/400

On page 125: Batch Installation of Lotus Domino for AS/400.

On page 129: Miscellaneous Tips and Techniques, for example:

- Environment variables
- Changing the size of the console
- Running Domino Tasks while the server is not running
- Tips for problem determination

Chapter 3:
On page 147: "Ending the Domino Subsystem" contains a warning not to end the Domino subsystem.

Chapter 4:
On page 170: "Change the Distribution Attributes" describes an additional step needed when setting up the SMTP MTA in combination with OfficeVision/400.

On page 179: "Language Dependent Character Set Conversions "describes how to configure the MTA to convert character sets different from US-ASCII.

On page 209: "Mixed Address Lists Not Sent to Every Recipients" addresses a problem when sending mail from OfficeVison/400 to Domino.

Chapter 5:
On page 248: Section "Coexistence of Directory Synchronization, Replication and Shadowing" describes how different types of directory synchronization and shadowing function can produce an endless loop and how his can be avoided.

Chapter 7:
On page 298: "Configuring the Remote PC Workstation for PPP Dial-in" contains more complete examples on how to set up a Windows 95 workstation to connect to a Lotus Domino for AS/400 server through a dial-up connection.

On page 324: "Server-to-Server Dial Connections with Remote LAN Service" explains how to set up the Lotus Domino for AS/400 server to initiate the dialing process to connect to another server for replication or mail routing using OS/400 Version 4 Release 2 or later.

Chapter 8:
On page 343: Chapter 8Migration From Other Domino Platforms**"** shows methods to migrate Domino form the Integrated PC Server or other platforms to Lotus Domino for AS/400.

Appendix B:
On page 413: Appendix B "The IBM Rochester Experience" provides a short report of the migration to Lotus Domino for AS/400 at the IBM Rochester Development Laboratory and Manufacturing Plant.

Many minor corrections have been made in chapter 7, chapter 8 and appendix B are new, therefore the changes or not inidividually marked.

The Team That Wrote This Redpaper

This redpaper was produced by a team of specialists from around the world working at the International Technical Support Organization, Rochester, Minnesota, USA.

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A number of people provided support and guidance throughout the production of this book. We especially want to thank the following people (in alphabetical order):

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Chapter 1
Overview of Lotus Domino for AS/400

This chapter describes Domino for AS/400, the history of Lotus Notes and Domino integration with the AS/400 system.

What Is Lotus Domino for AS/400?

Domino for AS/400 is the implementation of a Lotus Domino server on the AS/400 platform. Lotus Domino, on any of the supported platforms, is a combination of several different server types. Some of these server types are as follows:

- Mail server or Notes, POP3 or IMAP4 clients
- Database server
- Database replication server
- HTTP server
- Many other servers (for example, LDAP)

In supporting these servers, Domino supports many protocols. These protocols include the following:

- For messaging, Domino supports Post Office Protocol 3 (POP3), Internet Message Access Protocol (IMAP), Lightweight Directory Access Protocol (LDAP), Simple Mail Transfer Protocol (SMTP), and Multipurpose Internet Mail Extensions (MIME).
- For Web use, Domino supports Hyper Text Transfer Protocol (HTTP), Hyper Text Markup Language (HTML), and Network News Transfer Protocol (NNTP).
- Domino Internet security includes support for the Secure Sockets Layer (SSL) protocol and X.509 certificates. You can use your existing Internet infrastructure with Domino and be assured that your system works with other systems based on open protocols.

Domino is available on a number of platforms, including IBM OS/2, IBM System/390, Microsoft Windows NT, Novell NetWare, and several types of UNIX operating systems. Now with Domino for AS/400 Release 4.6, the AS/400 system is also a supported platform for Domino.

Domino can actually work on any of the supported platforms as a server for clients with many different protocols. Domino contains the original Notes server, which has been extended by several Internet standards for client/server relationships. One (probably the most important) of those standards is HTTP. Other Domino server functions include mail servers of various kinds (Notes Mail, POP3, IMAP4), Calendaring & Scheduling, Database Server, Replication, Workflow, etc.

The excerpt below from Bob Tipton's (Whittman-Hart, Inc.) 1997 white paper, "Domino for AS/400: Uniting Two Hall of Fame Technologies" attempts to give a concise explanation of Domino.

"Domino defies easy definition because Domino is so many things all at once. It is electronic mail, it is workflow-based computing, it is a productive, visual client/server programming tool, it is database and document management, it is highly secure, it is platform neutral, and it is the standard by which all other (groupware) solutions . . . are measured."

To read the complete white paper, refer to the Web site:

`http://www.as400.ibm.com/notes`

Application Development and Domino

Domino makes developing applications that automate business processes easy. For an organization with heterogeneous platforms and operating systems, use the seamless cross-platform design of application databases created with the Lotus Notes Designer for Domino client. With the Notes Designer for Domino client, you can start creating applications from a graphical user interface (GUI) with no knowledge of programming or scripting languages.

On the other hand, experienced application developers can create complex workflow or other GUI-based client/server applications with much less effort compared to traditional computer systems. Templates make setting up and configuring applications fast and easy. Applications on Domino can:

- Route information automatically
- Alert users that an item is overdue or needs attention
- Exchange information with enterprise software like relational databases and transaction processing systems
- Push information to user desktops

Domino supports a wide variety of clients:

- The Notes client - the most feature-rich client available
- IMAP clients, such as Lotus Mail and Qualcomm Eudora
- NNTP clients, such as Internet news readers

- Internet browsers, such as Microsoft Internet Explorer and Netscape Navigator
- LDAP clients

History of Lotus Notes and Domino Integration with AS/400 System

In 1996, IBM began implementing Lotus Notes on the Integrated PC Server for the AS/400 system.

The *IBM Integrated PC Server for AS/400*, formerly known as File Server Input/Output Processor or FSIOP, is a special type of input/output processor (IOP) inside of the AS/400 system. The FSIOP is a PC Processor card that fits within the AS/400 system unit. At the same time, it can serve as a normal IOP, providing a high performance local area network (LAN) adapter to AS/400 applications and its Intel 80486 DX2 processor can be used to run programs originally written for personal computers.

OS/400 integration of Lotus Notes provided many opportunities for the AS/400 user. Although the Notes software running on the AS/400 system is the same as that running on an OS/2 server, the integration with the AS/400 system provided some additional advantages:

- Maintenance of Notes users through an AS/400 interface
- Database integration
- Directory synchronization, one way from OS/400 System Distribution Directory (SDD) to Domino Public Address Book (PAB)
- Integration of Notes mail with AS/400 mail
- Backup and recovery of Lotus Notes databases

In May of 1997, the FSIOP became what we now call the Integrated PC Server (IPCS). The installation process was rewritten, the number of users increased greatly, the processor became a faster Pentium 166, and the Lotus Notes Server was renamed Domino. The installation process was enhanced to support the AS/400 CD-ROM drive to eliminate the administrative PC
for the installation process.

More IBMers and Business Partners became aware of the value of this collaborative Web environment being managed by their AS/400 system. Over 4,000 were sold in the first part of 1997, and numerous success stories can be found in the case studies section of our AS/400 home page. Customers began using Domino on the IPCS for too many applications to mention and began realizing the integration points, especially in the directory, were a reason to make the AS/400 system their universal mail server in addition to their hub for client server groupware applications.

In 1997, a Domino server on the AS/400 system using the Integrated PC Server, provided the following advantages:

- Pentium 166 processor
- Improved installation
- Requirement for administration PC for the installation process was removed
- CD Drive on RISC used for installation, CISC needs PC

Some limitations of this solution were:

- ADSM is required for granular backup
- DataPropagator is required for data movement
- No real-time access from Domino to DB2/400 data
- Only one-way directory shadowing
- The Domino server running on a separate processor cannot take advantage of all the AS/400 system management functions.

Domino for AS/400 Solution

After having done the first steps by implementing Domino on the AS/400 Integrated PC Server, it became more and more clear that the AS/400 architecture would be able to provide much more benefit to groupware users if Domino were implemented directly as an AS/400 application rather than as an OS/2 application on the IPCS.

Therefore, the UNIX version of the Domino product was ported to the AS/400 platform to run directly on an AS/400 system. This new product named *Domino for AS/400* became available for customers in February 1998 with many advantages over the previous coprocessor based implementation.

Domino for AS/400 is a powerful solution for building and deploying e-Business applications. As a server, the AS/400 system provides reliability and scalability, which are essential in the dynamic and often unpredictable e-Business environment. Domino for AS/400 has the power and tools to enhance existing business applications and reach new levels of collaboration and coordination.

Scalability

Within a single architecture, the AS/400 system family spans a vast performance spectrum. On the high-end, running on the new 12-way AS/400e series model, Domino for AS/400 provides processing strength of up to 16 partitions, which allows the capability of accommodating 10,400 active mail users[1] in a NotesBench comparison.

[1] Note that you cannot necessarily relate the number of NotesBench users to the users that can be supported in a real-life environment. The NotesBench numbers should only be used to compare different server platforms.

Reliability and Availability

Domino for AS/400 takes advantage of the reliability and availability features of the AS/400 system, such as RAID-5, mirrored disk units, and integrated backup capability. Each Lotus Domino server runs as an OS/400 application in its own subsystem. The unique AS/400 architecture makes it safe to run the Domino server and mission-critical business applications on the same machine.

Integration

Domino for AS/400 includes integration between Domino and DB2/400 databases. Domino for AS/400 maximizes its integrated access to OS/400, allowing direct, real-time access to DB2/400. Data can be accessed through several methods, providing tight integration between Domino and DB2/400. For example, a feature of the Lotus Notes client known as DB2 Import Library allows an SQL query to be run and the results to be automatically imported into a Notes rich text field.

Domino for AS/400 provides Notes applications with direct access to DB2/400 using @DB-functions or LotusScript:Data Object (LS:DO) to move and combine data. When these functions are executed on the Domino server, an ODBC driver or middleware communications layer is not needed, for example, when DB2/400 data is accessed from a Web browser or when running an agent.

In addition to the standard Domino database tools, such as @DBlookup and LS:DO provided by Domino for AS/400, a separate product, Lotus NotesPump 2.5, was also ported to the AS/400 system to allow replication with the DB2/400 relational database, scheduled, high-volume data transfer, as well as real-time access or relational data (new with NotesPump 2.5a).

Domino for AS/400 mail integration uses Simple Mail Transport Protocol (SMTP) and Mail Transport Agent (MTA) in combination with the AnyMail/400 framework to enable Domino to interact with other mail systems on an AS/400 system. These systems include OfficeVision, JustMail, POP3, and Internet e-mail.

Domino for AS/400 also includes a directory synchronization function which allows you to propagate changes in the Domino Public Address Book (PAB) and the AS/400 system distribution directory in both directions.

Proven Security

Integrated, flexible security is a strength of both Domino and AS/400 architecture. The AS/400 system has been enhanced with Firewall for AS/400, an integrated firewall that runs on the AS/400 Integrated PC Server.

Domino for AS/400 Advanced Services

The Domino server on an AS/400 system provides the same functions as a Domino server on other platforms, including some functions which are only available on selected platforms. One example is partitioned servers, which comes as a part of Advanced Services.

Formerly (that is, before July 1998) Lotus Domino Advanced Services required a separate license. Now it is part of the Lotus Domino Enterprise Server. That is, even if your AS/400 system has four processors or less, you need to purchase the Domino Enterprise Server License to be able to use Advanced Services (as opposed to the Domino Standard Server License, which would be sufficient for one to four processor system, but does not include Advanced Services).

The Advanced Services (provided as option **7** on the installation CD) enhance the Domino for AS/400 server with the following capabilities:

- Partitioned servers
- Clustered servers
- Billing

The following sections briefly describe these functions.

Partitioned Servers

Partitioned servers allow multiple Domino servers to run on a single computer. This feature is a part of the Lotus Domino Enterprise Server License and is available only for use on AS/400, NT, and UNIX.

Note Domino for AS/400 supports up to 16 partitioned servers, as opposed to NT or UNIX platforms, which only support up to 6 partitions.

Partitioning a single computer into separate servers provides:

- Full Domino security for users of partitioned servers
- Reduced number of computers to own and administer in order to support independent groups of users
- Easy migration from partitioned servers to individual servers

Clustered Servers

A server cluster is a group of Domino servers in the same domain connected by a local area network. Clusters provide high availability of data and services by allowing the services of a failing or over-committed server to be taken over by a different server within the cluster. To protect against software failures with the Domino product or to bypass planned downtime (for example while saving the data to tape), you may also use partitioned servers as part of a cluster.

Server Cluster on a Single AS/400 System

The high availability of AS/400 systems makes it possible to implement more logical servers on the same hardware and even combine the concepts of partitioned servers and server clusters *on the same hardware*.

Billing

The billing feature enables a Domino server to track specific Domino activities. The billing server task collects the billing information provided by the server and records the data for billing purposes.

Domino servers can track specific activities for billing. Each type of activity is designated by a billing class. You select which activities you want the server to track by adding classes to the Billing Class setting in the NOTES.INI file. A server with billing enabled is referred to as a "billing server."

Customers or users access billing information through an API. An API is a set of subroutines and data structures that allows you to write programs that access databases.

For more information, see the *Lotus Notes API 4.6 User Guide* and *Lotus Notes API 4.6 Reference*.

Administering and Using Domino for AS/400

Managing the Domino server includes many different tasks. Depending on the task, you can use the AS/400 user interface, Operations Navigator, Notes administration client, Web administration client, or even a text editor. Some tasks may be managed in more than one way.

There are three main types of management tasks to perform:

- Managing the server while it is running is mainly done from the host operating system of the Domino server and the Domino console. Examples of these tasks are: starting the Domino server, stopping the Domino server, setting variables, running server tasks.
- Configuration of the server is mainly done from a Notes client. For example, you would change server settings in the Server document by using the Notes client. Editing the NOTES.INI file, however, can be done from an AS/400 command line interface using the Edit File (EDTF) command supplied with PTF SF45296 for OS/400 V4R2 (SF49052 for V4R3) or a PC-based ASCII editor.
- User and database management is mainly done from a Notes client. For example, you would use the Notes client to create users, replicate databases, change database security, and add a server connection. You can also use Operations Navigator to create an AS/400 user profile and register the user for Domino at the same time. Using Operations Navigator to manage Domino users is discussed in more detail in "Registering a Notes User Based on an AS/400 User Profile" on page 278.

Domino for AS/400 Users

A Domino server on AS/400 can have different types of users:

- *Domino-only users*. These users connect to the Domino server from a Notes client or a browser. They do not use any AS/400 functions except the Domino for AS/400 server. These users do not need an AS/400 user profile.
- *Domino and AS/400 users*. These users connect to the server from a Notes client or a browser. They also access your AS/400 in others ways, such as with 5250 workstation emulation or Client Access. These users need both an AS/400 user profile and a Domino registration.
- *Domino users who need DB2/400 access*. These users might never appear to run an AS/400 application. However, they might use a Notes application that accesses DB2/400 data. Whether they need an AS/400 user profile depends on how you design your Notes application.

Setting Up Domino for AS/400 Users

When you set up a new Domino user on a server, the server application creates the following:

- A Person document in the server Public Address Book.
- An ID file for the user. The ID file contains the certificate that the Notes client uses to authenticate with the server. The user's workstation must have a copy of this ID file for the user to connect to the server successfully.

Two options are available for setting up Domino for AS/400 users:

- From a Notes client workstation connected to the Domino server, use the administration function that is part of Domino to set up a new user. This method does not create an AS/400 user profile for the Domino user. However, the directory synchronization function copies the user entries from the Domino Public Address book to the AS/400 system distribution directory.
- From an administrator workstation connected to the AS/400 system, you can use Operations Navigator to create an AS/400 user profile and register the user for Domino at the same time. Use this method to also register an existing AS/400 user as a Domino user. An administrator workstation needs both a Notes client connection to the AS/400 system and an AS/400 Client Access for Windows 95/NT connection to the AS/400 system.

To create an AS/400 user profile, your Domino administrator's AS/400 user profile must have *SECADM authority. To give a user *SECADM authority, change the authority field in the user profile. You can use either the *Change User Profile* (CHGUSRPRF) command or Operations Navigator to change a user profile.

For details on directory synchronization, see the *Domino for AS/400 Help* database (AS400HLP.NSF) or the book *Installing and Managing Domino for AS/400,* Lotus Part. No. 12999.

Database Integration

Integration between Domino and DB2/400 databases is an important feature of Domino for AS/400. Three methods are available for Domino applications to access (and potentially update) DB2/400 databases:

- LotusScript applications use LS:DO (LotusScript data object) as an interface to DB2/400 data.
- Agents written using the Domino formula language can use @Db functions to interact with a relational database, including DB2/400.
- The NotesPump product (an add-on Domino product that you can order separately) provides easy-to-use methods for synchronizing information in Domino databases with information in DB2/400 databases.

All three methods for accessing DB2/400 from Domino establish a connection from Domino to AS/400 system. The connection specifies both the user profile whose authority the system uses to access DB2/400 database files and a password for that user profile.

For details on database integration, see the *Domino for AS/400 Help* database (AS400HLP.NSF) or Chapter 6 of the book *Installing and Managing Domino for AS/400,* Lotus Part. No. 12999.

Integration of Notes Mail and OS/400-Based Mail

With an integrated approach of managing many different types of applications, OS/400 also allows you to integrate multiple types of mail applications. The AnyMail/400 Mail Server Framework (MSF) included with OS/400 made its debut two years ago to provide seamless connection to the Internet world from the AS/400 Systems Network Architecture Distribution Services (SNADS) environment without external mail gateways. At this time, the underlying e-mail support for OfficeVision/400 users, POP3 users, SMTP and other mail interfaces was integrated directly into OS/400. AnyMail/400 serves as an integration point for all mail and messaging services on the AS/400 system, including the System Distribution Directory.

In addition, AnyMail provides middleware that allows programmable extensions of the AS/400 e-mail support by supporting application programs that snap into specific target points in the framework. This allows mail integration with other AS/400 program products and allows vendors and customers to build custom functions into the AS/400 system's e-mail support to address unique requirements.

One advantage the AnyMail framework offers Domino users is easy participation in an existing AS/400 mail environment. This may include users of OfficeVision and

POP3 clients (users of the AS/400 native POP3 server and SMTP capabilities). Domino integrated Message Transfer Agent (MTA) interfaces directly with the AnyMail/400 mail server framework (MSF) and takes advantage of the integrated OS/400 TCP/IP support.

Backup and Recovery of Lotus Notes Objects

A Domino server often contains important business information that may not exist elsewhere in your organization. For example, users may rely on e-mail for important communications that are not documented anywhere else. Similarly, an on-line customer service application may contain records that do not exist in printed form.

To protect the data from disasters (such as a site loss or hardware loss) and from human error, such as accidentally deleting a critical database, develop a good strategy for regularly backing up the information on your Domino server. Make a plan to back up the following:

- Objects that change infrequently, such as programs for the Domino product.

  The "Backing Up the Domino Programs and Product Files" section in the *Domino for AS/400 Help* database (AS400HLP.NSF) or Chapter 5 of the book *Installing and Managing Domino for AS/400* (Lotus Part. No. 12999), describes options for backing up the relatively static (unchanging) parts of your Domino server.

- Objects that change regularly, such as Domino databases.

  "Backing up all Domino databases" in the *Domino for AS/400 Help* database (AS400HLP.NSF) or Chapter 5 of the book *Installing and Managing Domino for AS/400* (Lotus Part. No. 12999), describes the options for backing up the dynamic (changing) parts of your Domino server.

Domino for AS/400 takes advantage of the AS/400 single-level store architecture. Domino databases and programs are spread across all the AS/400 disk units, along with other AS/400 objects. The OS/400 operating system automatically manages the allocation of disk space so that you do
not have to decide on which disk to place each single database. To back up information on the AS/400 system, back up logically (that is, by library or directory), rather than physically (that is, by disk unit). To plan a backup strategy, you need to understand the logical location of your Domino for AS/400 databases and programs.

For more information, see the *Domino for AS/400 Help* database (as400hlp.nsf) or Chapter 5 in the book *Installing and Managing Domino for AS/400*, Lotus Part. No. 12999.

Note For details about planning a backup strategy for your AS/400 system, using the Save menu and the SAV and RST commands, see the book *AS/400 Backup and Recovery*, SC41-5304.

Application Development and Add-ins

Regardless of your platform, Lotus Notes/Domino application development tools allow access to relational data using ODBC. Many existing applications use LotusScript:Data Object (LS:DO) or include @Db function statements with an ODBC parameter specified.

What is different about the AS/400 system is what OS/400 does with the database request after it leaves Domino. When the application is running on the Domino for AS/400 server, OS/400 intercepts the ODBC request and processes it by making direct calls to DB2/400. No ODBC driver or middleware communications layer is necessary. This provides the benefits of a shorter path length for optimum performance. It also eliminates the cost and work associated with installing, configuring, and managing an ODBC driver (unless you have client-based Domino applications or others that use ODBC functions directly).

Where to Find Information about Domino Application Development

Several sources exist to provide information about Domino application development topics.

Printed Manuals

Lotus Notes Designer for Domino 4.6 Programmer's Guide:

Part 1 describes scripts and formulas using LotusScript, including LS:DO.

Part 2 describes all @functions including the @DB functions.

Online databases

Lotus Notes C API

Lotus Notes C++ API

Lotus Notes Designer for Domino 4.6 Java Programmer's Guide

Lotus LSX Toolkit

LotusScript Data Object (LS:DO)

Information on the Internet

There is also information available from the Lotus User Assistance Web site at:

`http://www2.lotus.com/services/notesua.nsf`

AS/400 information is available from the AS/400 Online Library Web site at:

`http://as400bks.rochester.ibm.com.`

Packaging of Domino for AS/400

Currently, Domino for AS/400 is shipped by Lotus on a separate CD from other Domino platforms. In future Domino releases, it may be packaged on the same CD as other platforms.

Table 1 lists the Lotus SKU numbers used to order the English version of the product.

SKU	*Product*
021135	DOMINO 4.6 SRVR for AS/400 North American RETAIL
021140	DOMINO 4.6 SRVR for AS/400 International English RETAIL
021145	DOMINO 4.6 SRVR for AS/400 Demo and Evaluation International English
021155	DOMINO 4.6 SRVR for AS/400 Documentation Pack
G21920	DOMINO 4.6 SRVR for AS/400 North American Passport Media
G21921	DOMINO 4.6 SRVR for AS/400 International English Passport Media
G22215	DOMINO 4.6 SRVR AS/400 North American Passport Maintenance
G22216	DOMINO 4.6 SRVR AS/400 International English Passport Maintenance

Table 1. Packaging of Domino for AS/400

The Domino for AS/400 Release Notes are available on the product CD. The database file is named README.NSF and is stored in the directory identified for the server specified with the CFGDOMSVR command. Select *Domino for AS/400 Release Notes* when you are viewing the list of databases under the server from a Notes Client.

The *Installing and Managing Domino for AS/400* book is also included with the product CD in form of a Notes Help database, viewable from any Notes Client. The database file is named AS400HLP.NSF and is installed in the directory identified for the server specified with the *Configure Domino Server* (CFGDOMSVR) command. Select Domino for AS/400 Help when you are viewing the list of databases on the server from a Notes Client.

A printable version of this database is included on the product CD. You can view or print it from a workstation using Adobe Acrobat. The database file name AS400HLP.PDF and is located on the CD in the subdirectory called /OS400.

Table 2 lists the languages supported by Domino for AS/400.

North American English	Norwegian
International English	Swedish
French Canadian	Danish

German	Finnish
French	Japanese
Italian	Simplified Chinese
Spanish	Traditional Chinese
Brazilian-Portuguese	Korean
Dutch	Thai

Table 2. Languages Supported by Domino

Note The difference between "North American English" and "International English" is not the language. A North American license uses a longer encryption key than an international license. As a result, you cannot use an international key to decrypt data that was encrypted with a North American key. However, you can use either an international or North American key to decrypt data that was encrypted with an international key. Multi-national users who need to exchange encrypted documents should always use an international encryption key except when signing documents, which should always use the longer encryption key.

This difference also applies to user ID files and server ID files, as well as to the Notes client software. Several restrictions apply, if you have a mix of North American and International servers, users and software; for example, a North American ID file (server or user) cannot use the International software.

Because of United States government restrictions on encryption technology, it is illegal to take a North American license or user ID file outside of North America. When you travel outside of North America, you must use an international license.

Domino Documentation

The Domino server and Notes workstation come with documentation databases and many printed books for specialized tasks and individual situations. The following list will help you determine which documentation to read.

Note Lotus Domino for AS/400 is a Lotus product, which means that all the books directly related to this product are published by Lotus and cannot be ordered from IBM. Documentation about the AS/400 system that is not related to Lotus Domino has to be ordered from IBM.

Domino and Notes Administration

- *Installing and Managing Domino for AS/400* Lotus Part. No. 12999, also available as *Domino for AS/400 Help* database (AS400HLP.NSF), provides instructions for installing and managing Domino for AS/400.
- *Lotus Domino 4.6 Documentation Roadmap* provides an overview of Domino administration documentation.

- *Lotus Domino 4.6 Planning the Domino System* provides information for planning, deploying, and integrating a Domino system in all types of organizations. It also discusses Internet, intranet, and extranet strategies for Domino.
- *Lotus Domino 4.6 Configuring the Domino Network* shows network administrators how to configure specific network operating systems to work with Domino, and how to configure Domino to work with their network operating systems.
- *Lotus Domino 4.6 Install Guide* lists platform-specific instructions on installing and setting up Domino servers. The Install Guide for Servers is also available online as a database file named SRVINST.NSF.
- *Lotus Domino 4.6 Getting Started with Domino* explains how to roll out and set up Domino servers and users. It also covers security, replication, the Public Address Book, server connections, server commands, and other administration-related topics.
- *Lotus Domino 4.6 Extending the Domino System* explains how to set up Notes mail, Internet mail, Web server features, calendar and scheduling functionality, Advanced Services, and other administration-related topics.
- *Lotus Domino 4.6 Maintaining the Domino System* explains how to manage and maintain Domino servers, users, databases, and tools, and other administration-related topics.
- The *Release 4.6 Administration Help* database provides online Help and documentation for system and server administration tasks, deployment planning, and network configuration. The What's New view lists new features for administrators who are already familiar with Release 3.x. The information is also available in Planning the Domino System, Getting Started with Domino, Extending the Domino System, Maintaining the Domino System, and Configuring the Domino Network. The online database file name for *Release 4.6 Administration Help* is HELPADMN.NSF.
- *Lotus Domino 4.6 Release Notes* provides end-of-release information about new Domino features, software platform requirements, known limitations and restrictions, interoperability issues, and updates for the documentation set. The online database file name for the *Release Notes* is READMES.NSF.

Application Development

- *Roadmap to Lotus Notes Application Developer's Documentation* provides a task-oriented overview of the Notes application development documentation.
- *Lotus Notes Designer for Domino 4.6 Application Developer's Guide* provides guidelines for new and experienced application developers on how to plan, create, and test a Notes application.

- *Lotus Notes 4.6 Database Manager's Guide* focuses on the tasks involved in managing Notes databases: rolling out new databases, managing the access control list, setting up replication, and monitoring database activity.
- *Lotus Notes Designer for Domino 4.6 Programmer's Guide Part I and Part II* provides guidelines for writing scripts and formulas. This book also contains a complete reference for the Notes formula language, @functions, @commands, and LotusScript Notes classes.
- *Lotus Notes Designer for Domino 4.6 Java Programmer's Guide* provides guidelines for using the Java programming language to interact with Notes applications and databases.
- *LotusScript Programmer's Guide* provides guidelines for programming in the LotusScript language.
- *LotusScript Language Reference Manual* provides a complete reference for the LotusScript language.
- *Lotus Notes Designer for Domino 4.6 Install Guide* lists platform-specific instructions on installing and setting up Notes workstations. The *Install Guide* is also available online as a database file named WKSINST.NSF.
- *Lotus Notes Designer for Domino 4.6 Release Notes* provides end-of-release information about new Notes features, software platform requirements, known limitations and restrictions, interoperability issues, and updates for the documentation set. The online database file name for the *Release Notes* is READMEC.NSF.

Documentation for End-Users

- *Lotus Notes 4.6 Step-By-Step* is a beginner's guide for learning how to perform common tasks.
- *Notes Help* is a Notes database that provides context-sensitive information on all Notes client features, including information on designing and managing databases and using LotusScript. This information is also available in the *Programmer's Guide*, the *Application Developer's Guide*, and the *Database Manager's Guide*. The database file name for Help is HELP4.NSF.
- *Notes Help Lite* is a Notes database that provides context-sensitive information on most Notes client features. This database is a subset of Notes Help and is intended for mobile Notes users or users with limited disk space. The database file name for *Notes Help Lit*e is HELPLT4.NSF.

AS/400 System Architecture

The AS/400 system is designed and built as a total system. This means that facilities, such as security, a relational database, and networking capabilities, are fully integrated into the operating system and the machine. The user communicates with all of these functions through a single control language (CL), or by using the system menus and prompts.

Below are some important system concepts:

- *Layered machine architecture*. This architecture, together with the high-level machine interface, insulates user applications from hardware characteristics. It enables them to move to new hardware technology at any time without changing their application programs.
- *Object-based design*. Everything that can be stored or retrieved on the system is known as an object. Objects exist to make user interfaces and applications independent of the internal structure of the machine.
- *Single-level storage.* Main storage and disk storage appear contiguous. An object is saved or restored on the system through a device-independent addressing mechanism. This means that extra main storage or disk storage can be added to the system and used without affecting the application programs. A user or a programmer is not concerned as to where a program or a file is: if they want to use it, they simply name it.
- *Hierarchy of microprocessors.* In addition to the main System Processor, the AS/400 system has a large number of microprocessors. Every microprocessor is called input/output processor (IOP). This means that requests for data to be written to or read from any I/O device can be delegated to a specialized processor while the main system processor executes other applications.
- *OS/400* is much more than just an operating system for the AS/400 system, which is a single entity that fully integrates all of the software components needed for most commercial computing environments. For example:
  - Security
  - Relational database
  - Network capabilities

The book *AS/400 System Concepts*, GC41-9802, introduces the basic concepts of AS/400 architecture. For more information, see the *AS/400e series Handbook*, GA19-5486. It introduces the AS/400 system architecture and provides an overview to all hardware and software capabilities.

For a more detailed description, see *Inside the AS/400*, by Frank G. Soltis, SR28-5910-01, published by Duke Press, ISBN No. 1-882419-13-8. In this book, the AS/400 system's chief architect provides an in-depth look at the system's

design, architecture, and history. Included are detailed looks at the AS/400 system's Advanced Application Architecture. Technology-independent Machine Interface, Objects and Object Management, Integrated Database, Security and Authorization, Single-Level Store, Process Management, I/O System, and Client/Server Computing are other concepts discussed in this book.

AS/400 System Concepts

This section provides a brief overview of AS/400 system concepts. It includes an explanation of Control Language commands, the AS/400 Integrated File System, and security.

Control Language Commands

Control Language (CL) is used by system operators to perform functions such as monitoring the system, performing backups, or manipulating objects.

CL is much more than just a set of operator commands. Control Language is an interface between the system user and the AS/400. This includes all menus, high level languages, program product, and system utilities that use CL to perform various system tasks. These tasks include creating files, starting spooling files, changing operational priorities, and initiating work.

Designed for ease-of-use, the consistency and structure of AS/400 CL command names makes them easy to learn. Control Language command names consist of Verb and Subject abbreviations.

Domino for AS/400 users will need to become familiar with basic AS/400 CL commands. To learn more about AS/400 CL commands, see the book *AS/400e series CL Programming Version 4*, SC41-5721 and *AS/400e series CL Reference*, SC41-5722.

This information can also be found at the following AS/400 Web site:

`http://as400bks.rochester.ibm`

Table 3 lists commonly used Domino CL commands.

Command	*Description*	*Verb*	*Subject*
CFGDOMSVR	Configure Domino Server	CFG	DOMSVR
STRDOMSVR	Start Domino Server	STR	DOMSVR
ENDDOMSVR	End Domino Server	END	DOMSVR
WRKDOMCSL	Work with Domino Console	WRK	DOMCSL

Table 3. AS/400 CL Commands Commonly Used in Combination with Domino

Table 4 lists common CL verb and subject abbreviations. Once you become familiar with these abbreviations, you can perform almost any function on the

AS/400. In most cases, subject abbreviations are three letters. An exception to this rule are very often-used subject abbreviations, for example, F for File.

Verb	*Description*	*Subject*	*Description*
ADD	Add	CSL	Console
CHG	Change	DOM	Domino
CFG	Configure	DTAARA	Data Area
CPY	Copy	F	File
CRT	Create	JOB	Job
DLT	Delete	JOBD	Job Description
			continued
DSP	Display	JOBQ	Job Queue
EDT	Edit	LIB	Library
END	End	MSG	Message
RMV	Remove	MSGQ	Message Queue
RNM	Rename	OBJ	Object
RST	Restore	OBJD	Object Description
SAV	Save	SBS	Subsystem
STR	Start	SBSD	Subsystem Description
WRK	Work with	SPLF	Spooled File
		STS	Status
		SVR	Server
		TAP	Tape
		USR	User
		USRPRF	User Profile

Table 4. Common CL Verb and Subject Abbreviations

Integrated File System

AS/400 uses an object-based architecture. There are many types of objects and each object has certain unique characteristics. Some examples of objects include: files, programs, message queues, device descriptions, and user profiles. OS/400 treats each object type uniquely even though the control language (CL) commands are consistently simple and easy to use.

The AS/400 operating system, OS/400, and the objects it controls have proven immunity to viruses. However, the AS/400 server can be a carrier for a virus introduced from the Internet or e-mail. However, because of the structure of the AS/400 operating system, it is very unlikely that the operating system or objects contained within it would be exposed to the virus.

Typically, objects are accessed via a file system. Under the Integrated File System, there are multiple ways to store and manage objects. The Integrated File System allows the use of multiple logical file systems on a single AS/400 system. Each logical file system has its own structure and rules, and a common set of user interfaces and application programming interfaces. The AS/400 logical file systems of most interest for Domino users are the root files system and library file system.

Containing a hierarchical directory tree structure, the root file system allows for the storage of stream files. These files potentially contain long strings of data. PC files are an example of stream files. The Domino server's data directory on AS/400 is a subdirectory in the root file system. For example, /NOTES/DATA is a subdirectory in the root file system. Domino databases are stored in the root file system in the same format as on other Domino platforms. Domino for AS/400 controls the access to each database stored in the root file system. Access to these databases is limited to authorized client workstations.

The AS/400 library file system is a directory of object names, types, and storage addresses that point to the object. DB2/400 tables (physical and logical files) and AS/400 programs are the primary objects supported by the AS/400 library file system. Domino for AS/400 provides many ways of accessing DB2/400 data. It also provides many ways for AS/400 programs to access Domino databases. Both Domino for AS/400 and AS/400 programs are managed by the Integrated File System. For more information on DB/400 integration, see the book *Installing and Managing Domino for AS/400*.

Security

AS/400 security features protect the Integrated File System. Security features such as AS/400 user profiles and group profiles control access to the system. Special authorization is given to access specific resources such as libraries, programs, and files. These AS/400 security concepts are similar to Domino security concepts.

AS/400 basic authority levels include *READ, *CHANGE, *ALL, *EXCLUDE, and *USE. There are additional special levels of authority for object management and more advanced administrative tasks.

AS/400 and Domino have security concepts that compliment each other. The AS/400 security system protects Domino databases from any access outside of Domino. Domino security controls access within Domino for AS/400.

If you plan to use a Domino application to access DB2/400 data, you will need to control access at the AS/400 level and the Domino for AS/400 level.

Summary

There is powerful integration with Domino for AS/400. This integration encompasses centralized administration and management, universal mail framework, airtight security, direct access to DB2/400 data, and integration

with online transaction programs. The architecture of Domino for AS/400 allows for simplicity through integration - groupware, workflow, collaboration, Internet, enterprise applications, data warehousing and more - all on the same system. The AS/400 system is one of the most reliable in the industry and can fit the budget and needs of both small and mid-sized businesses. Domino for AS/400 can scale high enough to support over 10 400 NotesBench mail users on a single machine, and scale wide enough to accommodate a disperse geographic network. Domino for AS/400 is easy to use and administer.

Chapter 2
Installing and Setting Up Domino for AS/400

This chapter describes how to install the Domino server on an AS/400 system and proceed with its configuration through two possible methods: using CL commands from an AS/400 command line, or using the graphical user interface of the Operations Navigator supplied with Client Access/400 clients for Windows 95/NT.

Useful Publications

The following books are useful for setting up your AS/400 system:

- *Getting Your AS/400 Working for You*, SC41-5161, is included with each AS/400 system.
- *TCP/IP Fastpath Setup*, SC41-5430
- *TCP/IP Configuration and Reference*, SC41-5420
- *Client Access for Windows 95/NT - Setup,* SC41-3512
- The *Welcome Center CD,* which also comes with your AS/400 system
- The complete library of AS/400 books can also be found on the World Wide Web at:

  `http://as400bks.rochester.ibm.com`

  A great source for technical tips is the *AS/400 Technical Studio* Web page at:

  `http://www.as400.ibm.com/techstudio`

The *Domino Administration Help* database (HELPADMN.NSF) for Domino 4.6 provides all information on installing, configuring and administering Domino servers (but excludes AS/400-specific topics[1]). The content of this database also exists as printed versions in different books:

- *Planning the Domino System*, Part No. 12949
- *Getting Started with the Domino Mail Server*, Part No. 12947
- *Getting Started with the Domino Server*, Part No. 12948
- *Configuring a Domino Network*, Part No. 12950
- *Extending the Domino System*, Part No. 12953
- *Maintaining the Domino System*, Part No. 12954

[1] In future releases, AS/400 information may be included with the documentation covering all other platforms; however, for Domino 4.6, the AS/400-specific information is covered in a separate book and Help database.

The *Domino for AS/400 Help* database (AS400HLP.NSF) contains all AS/400-specific information and is also available as a printed book:

- *Installing and Managing Domino for AS/400*, Part No. 12999

The *Domino for AS/400 Release Notes* (README.NSF) database contains last-minute information specific to the AS/400 platform. A printed version comes with the Domino for AS/400 CD-ROM.

Changes in this Chapter

The following changes and additions have been made for the second edition of this redbpaper:

On page 39: The PTF for **the EDTF command** in **OS/400 V4R3 is** SF49052.

On page 52: Tips on problems with the LODRUN command.

On page 77: Ending the Domino Server

On page 104: Mistake (missing comma) in example to setup loopback.

On page 105: A new tip on correctly setting the connection document for server replication.

On page 124: Installing a New Version of Lotus Domino for AS/400.

On page 125: Batch Installation of Lotus Domino for AS/400.

On page 129: Miscellaneous Tips and Techniques:

- Environment variables
- Changing the size of the console
- Running Domino Tasks while the server is not running
- Tips for problem determination

Overview

As with the implementation of Domino servers on other platforms, the process of setting up a Domino for AS/400 server consists of two main phases:

1. *Installation* of the Domino software
2. The initial *setup (configuration)* of the Domino server

For the installation of the Domino for AS/400 software you need to use the *Load and Run* (LODRUN) command. This OS/400 CL[2] command calls a program on the Lotus CD-ROM that prompts the user to select the options and components to

[2] Control Language (CL) is the language of OS/400. CL consists of a set of commands for performing system functions. You enter CL commands from a command line on any system display. The command line usually appears at the bottom of the display and has an arrow to prompt you. A series of CL commands can also be compiled to create a CL program.

be installed. After the user has selected which options to install, this command performs a *Restore Licensed Program* (RSTLICPGM) command which is invisible to the user, and includes copying the code from the CD-ROM onto the server's disk storage, decompressing it and creating a certain storage infrastructure (subdirectories, libraries, or other objects depending on the operating system).

For the second phase, Domino server configuration, you have two options:

- Use the AS/400 interface (often called the "green screen method"), executing *Configure Domino Server (CFGDOMSVR)* command.
- Use the *Operations Navigator* from a Notes client workstation[3]. You set up the Domino server by entering data into a Notes setup database. The *Operations Navigator* provides a graphical user interface which allows you to manage and administer an AS/400 system graphically.

Even if you decide to install and configure using the AS/400 user interface, you must install a Notes client for some administration tasks. This Notes client could be any Notes version. However, to fully support all administration functions, we recommend that you use a client with the same version as the server. When installing the Notes client, make sure you select Notes Designer for Domino, rather than the default version Notes desktop.

Starting in July 1998, the Domino for AS/400 product package also contains a CD-ROM with a Notes client. However, the license that comes with this package is restricted for use only for administering a Domino server. If you want to use other Lotus Notes functions, you need to purchase additional client licenses from Lotus.

Prerequisites for Domino for AS/400

Before you install Domino for AS/400, you have to install the hardware and software necessary to support the Domino server on the AS/400 system.

AS/400 Hardware and Software Prerequisites

These are the prerequisites for the Domino server running on an AS/400 system:

- An AS/400 RISC model (Domino for AS/400 is not supported on CISC hardware)
- Operating System/400 (5769-SS1) Version 4 Release 2 or later

[3] In this case, you must install and set up a Windows 95 or Windows NT 4.0 workstation; Notes 4.6 designer client; Client Access for Windows 95 or Windows NT, Operations Navigator and the Domino plug-in before setting up the server.

- To be used with OS/400 Version 4 Release 2, Lotus Domino for AS/400 requires the cumulative PTF[4] package C8045420 (or later) and C8202420 for V4R3. The web page *http://www.as400.ibm.com/notes* also contains latest information on necessary PTFs for OS/400 or other AS/400 licensed programs. Click on the line *Support, QMU, QMRs, PTF* in navigation frame on the left side of the page.
- TCP/IP connectivity utilities for AS/400 (5769-TC1), if you plan to use mail integration.
- At least 16MB base memory.
- 0.5MB to 1MB for each additional mail user is a good estimate to provide sufficient memory for the workload typically created by each user.
- 490MB disk space for Domino executables and data (templates and help files).
- 50MB disk space for each registered and active mail user. This is a very rough estimate; the actual amount of disk space needed depends largely on the Domino applications and the data stored in the Notes databases.
- Lotus Domino for AS/400 version 4.6 or later software on a Lotus CD-ROM.

  Note The software appears on the AS/400 system as "licensed program" 5769-LNT, which follows the same numbering scheme as IBM program products. However, 5769-LNT is *not* an IBM order number. Domino for AS/400 can only be ordered from Lotus or Lotus authorized resellers.
- The latest Quarterly Maintenance Update (QMU) can be obtained free of charge from the Internet at:

  `http://www.as400.ibm.com/notes`

  or

  `http://www.notes.net/downqmr.nsf/Download+File`

  The QMU for Domino for AS/400 is basically an AS/400 Save file containing PTFs to be loaded for the 5769-LNT product. Please follow the latest instructions on the Web page for additional information. Note, even though the fixes are implemented as AS/400 PTFs, those PTFs cannot be ordered via IBM support.

Note Future releases of Domino, called Quarterly Maintenance Releases (QMR), have to be purchased, unless the customer buys the Software Subscription (maintenance). This applies especially if customers did not purchase a license in the first place, but used the "Demo & Evaluation" package. In this case, the full

[4] PTF stands for Program Temporary Fix, a program package allowing to apply corrections to applications and operating system functions installed on the AS/400. A cumulative PTF package (also called "CUM. tape" is a collection of important PTFs for OS/400 and other IBM licensed programs being delivered to customers on request or on a periodic basis.

server license needs to be purchased in order to receive a new release.

Optional Software to Install on the AS/400 System

Depending on your needs and how you want to use and administer the Domino for AS/400 server, you may also want to install additional software on your AS/400 system.

The Edit File (EDTF) Command

The *Edit File* (EDTF) command is an AS/400 user interface editor for stream files residing in the OS/400 Integrated File System (IFS), for example, the Domino initialization file NOTES.INI. This command is provided in the separately ordered PTF SF45296 (that is, it is not part of any CUM tape for OS/400 V4R2).

The appropriate PTF for OS/400 V4R3 is SF49052.

Note See the special instructions needed to implement this PTF, the "Apply and Activate the PTF to Support EDTF and DSP STMF" on page 41.

Operations Navigator

If you plan to use the graphical user interface *Operations Navigator* to configure or administer Domino for AS/400 servers, you need to install the following AS/400 licensed products or product options on your AS/400 system:

- OS/400 Hosts servers (option **12** of 5769-SS1)
- AS/400 Client Access for Windows 95/NT 4.0 (5769-XD1)[5]
- AS/400 Client Access, 5763-XD1, V3R1M3 Cumulative Service Pack

Supported Networks and Protocols

The Domino server for AS/400 uses the TCP/IP network protocol to connect to Notes clients or other Notes or Domino servers.

Supported Notes Workstations

The Domino for AS/400 server can connect to any Lotus Notes client or Domino server running on any operating systems supporting TCP/IP.
Below are some examples:

- AIX 4.1.5 or 4.2.1
- HP-UX 10.20
- Sun Solaris Intel Edition 2.5.1, or Sun SPARC Solaris 2.5.1
- Microsoft Windows 95 or Microsoft Windows NT 4.0

Earlier versions of Lotus Notes clients can also connect to the Domino for AS/400 server. However, some Domino administration functions may require the Notes 4.6 client.

---

[5] Those parts of AS/400 Client Access mentioned here are all free of charge. If you plan to use other Client Access functions such as 5250 emulation, which is not free, you also have to order AS/400 Client Access Family for Windows, 5769-XW1.

Client for Notes Administrator Workstation

You should install at least one Notes client workstation in your organization to administer a Domino server on an AS/400 system. This Notes client should have the following:

- An operating system supported by the Lotus Notes Release 4 client
- TCP/IP, installed and configured
- Lotus Notes 4.1 client or later; however, to make sure all administration functions are supported, it is recommended that you use the same Notes Release as the Domino server, that is, for Domino Release 4.6b, a Notes client 4.6 should be used. Make sure that you install the full administration functions. For Lotus Notes 4.6, the Notes Designer for Domino license needs to be selected during installation. See the "Installing the Administrator's Workstation" section on page 88.

  Note A Lotus Notes Designer client is now shipped with Domino for AS/400.

To use the AS/400 Operations Navigator to manage the Domino server, you must install the following software on the administration workstation:

- Microsoft Windows 95 or Microsoft Windows NT 4.0 operating system
- Client Access for Windows 95 or Windows NT 4.0, 5763-XD1 V3R1M3 Cumulative Service Pack
- TCP/IP, installed and configured
- Lotus Notes 4.5 client with full administration functions or Lotus Notes 4.6 client with Notes Designer.

Pre-installation Tasks

Before installing the Domino server on your AS/400 system, you need to perform these tasks:

- Apply and activate PTF SF45296
- Decide on a name for the Domino server
- Configure TCP/IP on the AS/400
- Install and configure TCP/IP on a PC, the administrator's client.
- Install Lotus Notes on the administrator's client

Optional Pre-installation Tasks:

- Client Access installation and configuration on a Windows 95/NT 4.0 client PC, if you plan to use Operations Navigator to configure the Domino for AS/400 server

Apply and Activate the PTF to Support EDTF and DSPSTMF

PTFs SF45296 for OS/400 VR2 and SF49052 for V4R3 provide the objects for the *Edit File* (EDTF) and the *Display Stream File* (DSPSTMF) commands. In previous releases, the source members for these tools were provided in library QUSRTOOLS. Therefore, you may have an older version of these tools in one or more libraries on your system. However, the functions of the older tools are different than the ones provided with this PTF. To make sure to use the correct version of the tools, existing objects with the same name should be deleted before restoring the tools provided with the PTF.

After loading and applying the PTF, the objects for the EDTF and DSPSTMF tools are provided in a Save file (an object of type *SAVE) QGPTOOLS in library QGPL. If you want to use these tools, you should do the following:

- Sign on to the system with a user profile that has *ALLOBJ authority.
- Delete any old objects that exist on your system for these tools. This *must* be done to avoid incompatibilities. Use the following commands to remove all the objects from your system before restoring from the save file:

  All objects for EDTF:

  ```
  DLTPGM PGM(*ALL/EDTF)
  DLTF FILE(*ALL/EDTF)
  DLTCMD CMD(*ALL/EDTF)
  ```

  Objects for DSPSTMF:

  ```
  DLTPGM PGM(*ALL/DSPSTMF)
  DLTPGM PGM(*ALL/HEXEDITOR)
  DLTPGM PGM(*ALL/HEXEDTATN)
  DLTSRVPGM SRVPGM(*ALL/HEXEDTSRV)
  DLTF FILE(*ALL/HEXEDITOR)
  DLTCMD CMD(*ALL/DSPSTMF)
  ```

- Determine which user library will contain the tools objects, and create it if it does not exist:

  ```
  CRTLIB LIB(yourlibrary)[6]
  ```

- Issue the following command to restore the tools:

  ```
  RSTOBJ OBJ(*ALL) SAVLIB(QGPTOOLS) DEV(*SAVF)
  OBJTYPE(*ALL) SAVF(QGPL/QGPTOOLS)
  MBROPT(*ALL) RSTLIB(yourlibrary)
  ```

Configure TCP/IP on Your AS/400 System

In order to allow Notes clients or Web browsers to connect to Domino for AS/400, the OS/400 TCP/IP support must be configured and started. TCP/IP is a service of the operating system that Domino is using. This topic is not meant to replace

[6] For easy use, you may also store the tools objects in the library, QGPL.

AS/400 TCP/IP documentation, but it is intended to provide a minimum list of steps that need to be performed to activate TCP/IP on your AS/400 system.

Before you start configuring TCP/IP, a line description must exist. A line description is an OS/400 object of the type *LIND, which describes the characteristics of a physical interface to a communications network. For TCP/IP, you can use Token-ring, X.25, Ethernet, DDI, frame relay, or wireless networks.

The following steps describe how you configure a TCP/IP interface.

1. Sign on to the AS/400 with a user profile having at least *all object* (*ALLOBJ), *security administrator* (*SECADM) and *input/output configuration* (*IOCFG) special authorities.
2. You can use the *Configure TCP/IP* (CFGTCP) command to show a menu allowing you to perform all configuration tasks related to TCP/IP. In any OS/400 command line (indicated by the ===> symbol), type the following command and press **Enter**:

   CFGTCP

   You will see the *Configure TCP/IP* menu as shown in Figure 1.

```
CFGTCP                          Configure TCP/IP
                                                              System:   SYSTEM01
Select one of the following:

     1. Work with TCP/IP interfaces
     2. Work with TCP/IP routes
     3. Change TCP/IP attributes
     4. Work with TCP/IP port restrictions
     5. Work with TCP/IP remote system information

    10. Work with TCP/IP host table entries
    11. Merge TCP/IP host table
    12. Change TCP/IP domain information

    20. Configure TCP/IP applications
    21. Configure related tables
    22. Configure point-to-point TCP/IP


Selection or command
===> ____________________________________________________________________________
____________________________________________________________________________
  F3=Exit    F4=Prompt    F9=Retrieve    F12=Cancel
```

Figure 1. Configure TCP/IP (CFGTCP) Menu

3. Now you can use option **1** (Work with TCP/IP interfaces) to add a TCP/IP interface to your TCP/IP configuration. That is, you associate one or more Internet addresses with an existing line description representing a physical network interface. Type the number **1** in the command line at the bottom of the menu and press **Enter**.

You will see the *Work with TCP/IP Interfaces* panel as shown in Figure 2 on page 44.

Note It is possible that TCP/IP has already been set up on your AS/400 system. Look for an Internet address that does not have a line description of *LOOPBACK. If you don't see an Internet address other than the address associated with the *LOOPBACK description, you must configure TCP/IP. Otherwise, TCP/IP is already configured. For more information, see the book *Getting your AS/400 Working for You*, SC41-5161.

```
                        Work with TCP/IP Interfaces
                                                              System:   SYSTEM01
Type options, press Enter.
  1=Add   2=Change   4=Remove   5=Display   9=Start   10=End

     Internet          Subnet              Line      Line
Opt  Address           Mask             Description  Type
 1   10.1.2.3
     127.0.0.1         255.0.0.0        *LOOPBACK    *NONE



                                                                        Bottom
F3=Exit      F5=Refresh   F6=Print list   F11=Display interface status
F12=Cancel   F17=Top      F18=Bottom
```

Figure 2. Work with TCP/IP Interfaces

4. To add a TCP/IP interface, type the number **1** (Add) in the *Option* (Opt) field and the Internet address to be used in the field titled *Internet Address* as shown in Figure 2 and press **Enter**. The *Add TCP/IP Interface* (ADDTCPIFC)

command will be launched for you and you will see the prompt as shown in Figure 3.

```
                    Add TCP/IP Interface (ADDTCPIFC)

Type choices, press Enter.

Internet address . . . . . > '10.1.2.3'
Line description . . . . . .   TRNLINE      Name, *LOOPBACK
Subnet mask  . . . . . . . .   255.255.255.0
Associated local interface . . .  *NONE
Type of service  . . . . . .   *NORMAL      *MINDELAY, *MAXTHRPUT...
Maximum transmission unit  . . .  *LIND      576-16388, *LIND
Autostart  . . . . . . . . .   *YES          *YES, *NO
PVC logical channel identifier     ___       001-FFF
             + for more values     ___
X.25 idle circuit timeout  . . .   60         1-600
X.25 maximum virtual circuits  .   64         0-64
X.25 DDN interface . . . . . .   *NO           *YES, *NO
TRLAN bit sequencing . . . . . .   *MSB        *MSB, *LSB

                                                                    Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 3. Add TCP/IP Interface (ADDTCPIFC)

5. Enter the name of the line description and the subnet mask for your new interface as shown in Figure 3. (Contact your network administrator if you need more information about the values for your TCP/IP configuration.)
6. Press **Enter** to add the new interface and to return to the *Work with TCP/IP Interfaces* panel (Figure 2).

If you do **not** see "F11=Display interface status" at the bottom of the *Work with TCP/IP Interfaces* panel, you know that the TCP/IP support on your AS/400 system was **not** started yet. Continue with Step 7.

If you **do** see "F11=Display interface status" at the bottom of the *Work with TCP/IP Interfaces* panel, you know that the TCP/IP support on your AS/400 system **was** started. Go to step 13 to verify that the interface is working correctly.

7. Press **Enter** to return to the *Configure TCP/IP* menu (Figure 1 on page 43).
8. Start the TCP/IP support on the AS/400 system using the *Start TCP/IP* (STRTCP) command. Type the following command in the command line:

   STRTCP

   and press **F4**.

```
                          Start TCP/IP (STRTCP)

Type choices, press Enter.


                            Additional Parameters

Start application servers  . . .   *YES          *YES, *NO
Start TCP/IP interfaces  . . . .   *YES          *YES, *NO

                                                                       Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 4. Start TCP/IP (STRTCP)

You will see the prompt as shown in Figure 4. Press **Enter** to start the OS/400 TCP/IP support. You will see the *Configure TCP/IP* menu again.

9. Type the number **1** in the command line at the bottom of the menu and press **Enter**, to return to the *Work with TCP/IP Interfaces* panel as shown in Figure 2 on page 44.
10. Start the new TCP/IP interface by typing the number **9** next to the TCP/IP address and pressing **Enter**.
11. Press **F11** (Display interface status) to see if the new interface has become active.
12. Press **Enter** to return to the *Configure TCP/IP* menu (0).
13. To verify that your TCP/IP connection is active, you can use the *Verify TCP/IP Connection* (VFYTCPCNN) command, also known as PING. The easiest way to see the results of the PING command is to use the OS/400 Command Entry screen. To do so, type the following command on the command line and press **Enter**:

    `CALL QCMD`
14. Press **F10** (Include detailed messages).
15. Type the following command:

    `PING`

    and press **F4**.
16. Enter the Internet address you defined in step 4 on page 44 and press **Enter**.
17. The connection verification statistics should look like this screen.

```
                                Command Entry                        SYSTEM01
                                                          Request level:   4
Previous commands and messages:
   > PING RMTSYS('10.1.2.3')
     Verifying connection to host system 10.1.2.3.
     PING request 1 from 10.1.2.3 took 11 ms. 256 bytes. TTL 64.
     PING request 2 from 10.1.2.3 took 8 ms. 256 bytes. TTL 64.
     PING request 3 from 10.1.2.3 took 6 ms. 256 bytes. TTL 64.
     PING request 4 from 10.1.2.3 took 6 ms. 256 bytes. TTL 64.
     PING request 5 from 10.1.2.3 took 7 ms. 256 bytes. TTL 64.
     Round-trip (in milliseconds) min/avg/max = 6/7/11
     Connection verification statistics: 5 of 5 successful (100 %).

                                                                      Bottom
Type command, press Enter.
===> ____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
F3=Exit   F4=Prompt   F9=Retrieve   F10=Include detailed messages
F11=Display full      F12=Cancel    F13=Information Assistant   F24=More keys
```

Figure 5. Result of using the PING utility to verify TCP/IP connection

Note Verifying the connection by using the (numerical) IP address is normally not sufficient to ensure that the Notes clients or other Domino servers will be able to connect to your Domino for AS/400 server. By default, the Notes clients assume that the name of the Domino server to connect to is known as a TCP/IP host name[7]. Therefore, we talk about some naming considerations in the following section.

Naming the Domino Server

The close relationship between the TCP/IP host names and Domino server names makes it very important to think about the Domino server name. A Domino server may have a long name, even with embedded spaces. For example, ”Acme Domino Server One” would be a valid name for a Domino server. This type of naming is possible in Notes environments; however, the example given above is not a valid TCP/IP host name.

By default, when a Notes client (or another Domino server) tries to connect to a Domino server through TCP/IP protocol, it uses the common name, that is, the first part of the hierarchical name[8], as the TCP/IP host name. Such a naming convention would require connection documents to “translate” between the Notes/Domino name and the TCP/IP host name or IP address.

A simple solution is to use a short name with no spaces in it, for example AcmeDS1. The TCP/IP host name and the Domino server name can then be the same.

[7] By creating a connection document in the clients’ local address book, you could also assign an IP address directly to the name of a Notes or Domino server; however, this is not a very flexible solution.

[8] We always assume hierarchical names are used for Domino servers and Notes users.

Using the Same Name for the Domino Server and the AS/400 System

The easiest way to name a Domino for AS/400 server is to use the existing host name[9] of the AS/400 system. If you have an existing TCP/IP network, the AS/400 TCP/IP host name is probably already defined in the Domain Name System (DNS) server or HOSTS files of the clients (see "What Is a Domain Name System?" on page 48). This makes configuration much easier. Use the *Configure TCP/IP* (CFGTCP) menu *option 12* (or the *Change TCP/IP Domain* (CHGTCPDMN) command) to find out or define the host name of your AS/400 system.

Using Different Names for the Domino Server and the AS/400 System

Even though it may be the most obvious approach, it is not always possible to use the existing AS/400 name as the Domino server name. For example, if you plan to configure more than one logical server (a partitioned server) on the same AS/400 system, each server must have its own unique name.

Another example is when you plan to use the *Lotus Calendar Connector for Office Vision* (LCCOV) to exchange free time information between Notes calendars and OfficeVision/400 calendars. In such a case, LCCOV needs to uniquely identify the calendar on the Domino server and the one under OfficeVision by their respective names - which would not be possible if both names are the same.

Since all Domino for AS/400 servers - as an AS/400 application - use the AS/400 TCP/IP interfaces, the AS/400 system must be known in the network by more than one host name in order to allow Domino to use a different host name than other AS/400 applications.

Two concepts supported by the OS/400 TCP/IP implementation can help here: *Multi homing* and *Multi hosting*.

- *Multi homing* allows more than one (up to 128 characters per line, but not more than 512 per AS/400 system) Internet address to be defined on a single network adapter (represented by an AS/400 *line description*). If you decide each Domino server will use its own, unique TCP/IP address, then perform step 4 on page 44 more than once, each time entering different Internet addresses for the same line description.
- *Multi hosting* allows you to assign up to four host names (aliases) to the same IP address within the OS/400 host tables, or even more on DNS name servers. If you decide that more than one Domino for AS/400 server will share TCP/IP addresses, distinguished by name and port number, then just add *aliases* to the existing host table entries, either in the OS/400 table, a DNS name server database, or the Notes clients' host table.

If you do not have a DNS name server, make sure that all clients *and* the OS/400 host table contain entries to translate the server (non-qualified) host name to a

[9] Note, the TCP/IP host name of the AS/400 system *may* be identical to the AS/400 system name (and this is recommended); however, those are two different parameters and totally independent.

numerical Internet address. For example the host name `AcmeDS1` must be translated via host table or DNS to 10.1.2.3.

Caution If the host name used for a Domino server is only added to the clients' host table, but not to the OS/400 host table, most of the server functions may work perfectly. However, you may run into several problems later. For example:

- OS/400 SMTP support will not recognize that host name as a valid local SMTP domain name.
- You will not be able to configure NotesPump.

What Is a Domain Name System?

The Domain[10] Name System (DNS) is an application that enables a TCP/IP host (in our case, either a Domino server or a Notes client) to determine the IP address associated with a given host name.

The DNS is similar to a telephone book. The user looks up the name of the person or organization that he wants to contact and cross references the name to a telephone number. It is a hierarchical client/server-based distributed database. *Name servers* are programs, which constitute the server-site. Name servers contain information about some segment of the network in a database and make it available to the clients.

Hosts File Configuration

If you do not have a DNS for your TCP/IP network (or you don't want to use it), use the TCP/IP host table entries on your AS/400 system and the client workstations to associate the host name with the Internet address.

On Windows 95 clients, the host table is implemented with an ASCII file called HOSTS (usually in the WINDOWS directory). FigureFigure 6 shows the `HOSTS` file being edited with the DOS Edit command. If you don't find a file called `HOSTS` on your PC, look for a file called `HOSTS.SAM`, rename it to `HOSTS` (no extension) and edit it to contain the name(s) of your Domino server(s) along with the appropriate IP address(es).

[10] Note that there is no relationship between the Notes/Domino domain and the TCP/IP domain mentioned in this paragraph.

```
 File  Edit  Search  View  Options  Help
+---------------------------- C:\WINDOWS\hosts -----------------------
¦# This is a sample HOSTS file used by Microsoft TCP/IP for Chicago
¦#
¦# This file contains the mappings of IP addresses to host names. Each
¦# entry should be kept on an individual line. The IP address should
¦# be placed in the first column followed by the corresponding host name.
¦# The IP address and the host name should be separated by at least one
¦# space.
¦#
¦# Additionally, comments (such as these) may be inserted on individual
¦# lines or following the machine name denoted by a '#' symbol.
¦#
¦# For example:
¦#
¦#      102.54.94.97     rhino.acme.com          # source server
¦#       38.25.63.10     x.acme.com              # x client host

¦127.0.0.1       localhost
¦10.1.2.3        acmeds1
```

Figure 6. Example of a HOSTS file in a Windows 95 System

To create or modify the host table on your AS/400 system, use the *Configure TCP/IP* (CFGTCP) menu option **10.** FigureFigure 7 shows the host table on an AS/400 system.

```
                    Work with TCP/IP Host Table Entries
                                                          System:   SYSTEMA
Type options, press Enter.
  1=Add   2=Change   4=Remove   5=Display   7=Rename

     Internet         Host
Opt  Address          Name

  2   10.1.2.3        SYSTEMA
                      ACMEDS1
  _   127.0.0.1       LOOPBACK
                      LOCALHOST

                                                                   Bottom
F3=Exit   F5=Refresh   F6=Print list   F12=Cancel   F17=Position to
```

Figure 7. Example of Host Table Entries on an AS/400 System

Installation, Setup, and Configuration

The term *installation* is often referred to as the entire process of loading the software and getting it ready to be used.

To install Domino for AS/400, you need to distinguish three different tasks:

- *Installing* the software, which is basically copying the software from the distribution medium (CD-ROM) to the AS/400 system disk storage.

- *Setting up* one or more servers, which is creating an environment on your system where the server will run. You need to provide some basic configuration information; for example, the name of the server, whether or not ID files are to be created ("*FIRST" server), or will be obtained from an existing Domino server and others. While the Lotus Notes and Domino documentation refer to this task in many places as "setup," the command to do this on an AS/400 platform is called *Configure Domino Server* (CFGDOMSVR).
- *Configuring* the server is a task which can be done after the initial setup and even after the server is in use for some time. It involves changing parameters in the NOTES.INI file, the Public Address Book and other configuration databases.

This chapter concentrates on the tasks to install the software as well as setting up the server. Other configuration tasks are beyond the scope of this book. Refer to the Lotus Domino books and education material.

Installing the Domino for AS/400 Product on Your AS/400 System

This section guides you through the installation process. Installing the Domino software on the AS/400 system involves the following tasks:

- Decide which options of the software you want to install.
- Use the *Load and Run* (LODRUN) command on the AS/400 system to install the software.

Then you can use the *Display Software Resources* (DSPSFWRSC) command to verify which parts of the software are installed.

Using the Load and Run (LODRUN) Command

The *Load and Run* (LODRUN) command is used to start the installation program for Domino for AS/400 directly from the Lotus CD-ROM. To load the software onto your AS/400 system, perform the following steps:

1. Sign on to the AS/400 system with a user profile that has at least the special authorities *ALLOBJ and *SECADM.

For LODRUN, the special authorities *ALLOBJ (access to all AS/400 objects) and *SECADM (security administration) are sufficient. However, later for configuring the server, you will need *JOBCTL (job control) and *IOSYSCFG (device and communications configuration) special authorities as well.

You assign special authorities to an AS/400 user profile when you create it using the *Create User Profile* (CRTUSRPRF) command or when you change it using the *Change User Profile* (CHGUSRPRF) command. The AS/400 security officer has the required authorities. If you are not the security officer,

use the *Display User Profile* (DSPUSRPRF) command to determine if your user profile has the required authorities:

- Enter the AS/400 command:

  ```
  DSPUSRPRF user-id
  ```

  where user-id is your user ID (the name of your user profile).

- Press **PgDn** to display the special authorities for the user profile. If your user profile does not have the required authorities, ask the security officer to either run the commands or use the *Change User Profile* (CHGUSRPRF) command to add the required authorities to your user profile.

2. Insert the Domino for AS/400 CD in the AS/400 CD-ROM drive.
3. Type the following command on the AS/400 command line and press **Enter:**

   ```
   LODRUN DEV(*OPT) DIR('/OS400')
   ```

   This command starts the installation program directly from the directory /OS400 on the AS/400 optical device (*OPT). The Lotus Domino for AS/400 CD must be in the CD-ROM drive of your AS/400 system at this time (see Step 2).

   Tip If there are problems with this command, they are typically one of two reasons:

   - If you get an error message that says something like this:

     ```
     *LIBL not found in Library List.
     ```

     The common reason is that the library QTEMP is not in your library list when you ran the LODRUN command. To add QTEMP to your library list, you can use the *Add Library List Entry* (ADDLIBLE) command. Type the following command in any AS/400 command line:

     ```
     ADDLIBLE QTEMP
     ```

     Then run the LODRUN command again.

   - If you get an error message that says something like this:

     ```
     Request to optical device OPT01 failed.
     ```

     It means you are pointing to the wrong optical (CD) device. On AS/400 optical devices are typically named OPT01, OPT02, or similar. The device specification of *OPT indicates use the default optical device (typically OPT01). If for some reason your system has two optical devices and you have put your CD in the wrong one,then try DEV(OPT02).

4. The first function this program performs, is presenting a menu like the one shown in Figure 8 to select which of the product options you want to install.

```
         Install Lotus Domino For AS/400 Licensed Program (5769LNT)

Type options, press Enter.
 1=Install

           Product    Installed
Option     Option     Status         Description

  1        *BASE      *NO            Domino 4.6 Server
  1        1          *NO            AS/400 Integration
  1        3          *NO            C API Release 4.5
  1        4          *NO            C++ API Release 4.1
  1        5          *NO            LotusScript Extension Toolkit
  1        6          *NO            HiTest C API Release 4.5
  1        7          *NO            Advanced Services


F3=Exit      ENTER To Continue

(C) COPYRIGHT IBM CORP. 1980, 1998.
(C) COPYRIGHT LOTUS DEVELOPMENT CORP. 1998.
```

Figure 8. Select Product Options to install

5. Type the number **1** beside each product option you want to install. The following list describes the mandatory (*BASE) and optional parts of the product:

***BASE - Domino Server** is the base code that must be installed; programs, data and template files, SMTP MTA and all Help files.

Option 1- AS/400 Integration is the code that allows directory synchronization and the Operations Navigator to be used.

Note Directory synchronization also requires the HiTest C API (option **6**) to be installed and Operations Navigator has Client Access for Windows 95/NT (5763-XD1) as a prerequisite.

Option 3 - C API provides the header files and modules allowing ILE C applications to call functions of a Domino for AS/400 server.

Option 4 - C++ API provides header files, modules, and service programs for creating and running C++ applications which call functions of a Domino for AS/400 server.

Option 5 - Lotus Script Extensions Toolkit is the source code and files for creating LSX applications that can run on the Domino for AS/400 server.

Option 6 - HiTest C API is the header files for creating Notes HiTest™ C applications that can interface with a Domino for AS/400 server.

Option 7 - Advanced Services allows you to use partitioned servers, server clusters and the billing features of Domino servers. If you plan to have more than one server on your AS/400, you may want to install Advanced Services immediately, even if you want to start by using a single server only.

Note The code for Advanced Services is provided with every CD-ROM. However, to actually *use* Domino Advanced Services, you must purchase the Lotus Domino Enterprise Server License.

6. Press **Enter** to proceed with the installation.

   Note It may take up to 30 minutes to complete.

7. After the installation completes successfully, you can use the *Display Software Resources (DSPSFWRSC)* command to verify the software was installed. Enter the command **DSPSFWRSC** on any command line and you will see a display like the one shown in Figure 9. Press the **PgDn** key until you find the *Resource ID* 5769-LNT.

```
                          Display Software Resources

                                                                System:   SYSTEMA
Resource
   ID      Option  Feature  Description
5763XG1    5         2924    Client Access/400 - Graphical Access for OS/400
5763XK1    *BASE     5050    Client Access/400 for Windows 3.1
5763XK1    *BASE     2924    Client Access/400 for Windows 3.1
5769JV1    *BASE     2924    AS/400 Developer Kit for Java
5769LNP    *BASE     5050    Lotus NotesPump
5769LNT    *BASE     5050    Lotus Domino For AS/400
5769LNT    *BASE     2924    Lotus Domino For AS/400
5769LNT    1         5050    AS/400 Integration
5769LNT    1         2924    AS/400 Integration
5769LNT    3         5050    C API
5769LNT    4         5050    C++ API
5769LNT    5         5050    LotusScript Extension ToolKit
5769LNT    6         5050    HiTest C API
5769LNT    7         5050    Advanced Services
                                                                        More...
Press Enter to continue.

F3=Exit   F11=Display libraries/releases   F12=Cancel
F19=Display trademarks
```

Figure 9. Display Software Resources (DSPSFWRSC)

Note Once Domino for AS/400 has been installed on the AS/400 system, it is known to the operating system as "licensed program" 5769-LNT. This appears like an order number for an IBM Program Product. However, in this particular case, it is not an order number at all, because Domino for AS/400 is a Lotus product and Lotus has a different scheme of order numbers.

Note The base option, as well as option **1** of the product, appears in two lines in Figure 9. The reason for this is that the AS/400 system stores the executable objects differently from the language dependent objects, called Machine Readable Material (MRI). The feature number 2924 in the second line for those two options indicates that language ID 2924 (US English) for Domino for AS/400 is installed on this AS/400 system. However, language ID 2924 does *not* imply that this is the

North American encryption version of the product. Either version, International English or North American English, will appear with language ID 2924.

What Happens When the Domino Server Is Installed?

After the administrator has entered the desired values into the menu shown in Figure 8, an installation program residing on the Lotus Domino CD-ROM is started. This program performs a *Restore Licensed Program* (RSTLICPGM) command under the covers for each of the selected program options, which in turn copies and registers all objects for this product as a *licensed program* or a *software resource* in OS/400.

This is basically what happens:

- The QNOTES library is populated with AS/400 objects, such as programs (*PGM), service programs (*SRVPGM), message files (*MSGF) and other object types.
- The QNOTES user profile is created for use by the Domino server.
- The /QIBM/PRODDATA/LOTUS/ directory in the AS/400 integrated file system is populated with Domino resource files and other subdirectories.
- In the /QIBM/USERDATA/LOTUS/ directory in the AS/400 integrated file system, files with symbolic links to the objects in the QNOTES library are created.

What does *not* happen during this initial setup is the creation of the data directory for the Domino server (which would be the case on other server platforms for the Domino server). Creation of the data directory will be done during the second phase of the installation of Domino for AS/400 when the server is configured using the *Configure Domino Server* (CFGDOMSVR) command or the setup function of Operations Navigator.

National Language Considerations

The *Domino for AS/400 Release Notes* (also in the database README.NSF) describe some limitations and considerations for using Domino for AS/400 in languages other than US English.

Note that all language dependent settings are taken from the locale defined in the QNOTES user profile. The date format for the Domino server is taken from the locale associated with QNOTES. The following table shows the attributes that are picked up from the locale for each language.

If you need to specify different settings than those chosen by the installation process (based on the language of the CD-ROM), use the *Change User Profile* (CHGUSRPRF) command to specify all locale-specific job attributes that should be picked up from the specified locale. The locale name is

```
/QSYS.LIB/QNOTES.LIB/xx_yy.locale
```

where xx_yy is the value specified in the second column of the following table.

For example, to set the locale for German, use the following CL command:

```
CHGUSRPRF USRPRF(QNOTES)
  LOCALE('/qsys.lib/qnotes.lib/de_de.locale')
  SETJOBATR(*ccsid *datfmt *datsep *decfmt *srtseq *timsep)
```

Default Locale

For both the North American and International English versions of Domino for AS/400, the default locale is set to the value listed for "English US."

For each National Language Version (NLV) release of Domino, the default locale should be appropriate to the language.

Language	*Locale*	*CCSID*	*Date Format*	*Date Separator*	*Time Separator*	*Decimal Format*	*Sort Sequence*
Albanian	SQ_AL	500	*DMY	.	:	I	*HEX
Belgian English	EN_BE	500	*DMY	/	:	I	*HEX
Belgian French	FR_BE	500	*DMY	.	:	I	*HEX
Bulgarian	BG_BG	1025	*DMY	.	:	I	*HEX
Canadian French MNCS	FR_CA	500	*MDY	.	:	I	*HEX
Chinese, Simplified	ZH_CN	935	*MDY	/	:	*BLANK	*HEX
Chinese, Traditional	ZH_TW	937	*MDY	/	:	*BLANK	*HEX
Croatian	HR_HR	870	*DMY	.	:	I	*HEX
Czech	CS_CZ	870	*YMD	-	:	I	*HEX
Danish	DA_DK	277	*DMY	-	:	I	*HEX
Dutch	NL_NL	37	*DMY	-	:	I	*HEX
Dutch MNCS	NL_BE	500	*DMY	/	:	I	*HEX
English (UK)	EN_GB	285	*DMY	/	:	*BLANK	*HEX
English (US)	EN_US	37	*MDY	/	:	*BLANK	*HEX
Estonian	ET_EE	1122	*DMY	-	:	I	*HEX
Finnish	FI_FI	278	*DMY	.	.	I	*HEX
French (France)	FR_FR	297	*DMY	.	:	I	*HEX
French (MNCS)	FR_CH	500	*DMY	.	:	*BLANK	*HEX
German (Germany)	DE_DE	273	*DMY	.	:	I	*HEX
German (MNCS)	DE_CH	500	*DMY	.	:	*BLANK	*HEX
Greek	EL_GR	875	*DMY	/	:	I	*HEX
Hungarian	HU_HU	870	*YMD	/	:	*BLANK	*HEX

Language	*Locale*	*CCSID*	*Date Format*	*Date Separator*	*Time Separator*	*Decimal Format*	*Sort Sequence*
Icelandic	IS_IS	871	*DMY	-	:	I	*HEX
Italian (Italy)	IT_IT	280	*DMY	/	.	I	*HEX
Japanese (Latin)	JA_JP5035	5035	*YMD	/	:	*BLANK	*HEX
Korean	KO_KR	933	*YMD	/	:	*BLANK	*HEX
Latvian	LV_LV	1112	*YMD	.	:	I	*HEX
Lithuanian	LT_LT	1112	*YMD	,	:	I	*HEX
Macedonian	MK_MK	1025	*DMY	.	:	I	*HEX
Norwegian	NO_NO	277	*DMY	.	:	I	*HEX
Polish	PL_PL	870	*YMD	-	:	I	*HEX
Portuguese (Brazil)	PT_BR	37	*DMY	-	:	I	*HEX
Portuguese (Portugal)	PT_PT	37	*DMY	-	:	I	*HEX
Romanian	RO_RO	870	*DMY	/	:	I	*HEX
Russian	RU_RU	1025	*DMY	.	.	I	*HEX
Serbian (Cyrillic)	SR_SP	1025	*DMY	.	:	I	*HEX
Serbian (Latin)	SH_SP	870	*DMY	.	:	I	*HEX
Slovak	SK_SK	870	*DMY	.	:	I	*HEX
Slovene	SL_SI	870	*DMY	.	:	I	*HEX
Spanish	ES_ES	284	*DMY	/	:	I	*HEX
Swedish	SV_SE	278	*DMY	-	.	I	*HEX
Thai	TH_TH	838	*MDY	*BLANK	:	*BLANK	*HEX
Turkish	TR_TR	1026	*DMY	/	:	I	*HEX

Table 5. Locales Used for Supported Countries

Changing the Date Format

The date format for the Domino server is affected by:

- The locale for the QNOTES user profile
- The Local Job Attributes values specified for the QNOTES user profile
- Whether DateOrder is specified in the NOTES.INI file
- The QDATFMT system value

The OS/400 processes (jobs and threads) that the Domino server runs under, have a job attribute for the date format. When *DATFMT is specified on the Local Job Attributes for the QNOTES user profile, the date format job attribute is determined from the locale. Otherwise, the job attribute is determined by the value in the QDATFMT system value. In addition, the Domino server keeps an internal date format setting. If a `DateOrder` keyword is specified in the NOTES.INI file, the

internal setting will be the value specified for the DateOrder. Otherwise, the date format will be determined from the locale.

Normally, the QNOTES user profile has a value of *DATFMT specified on the Locale Job Attributes and the NOTES.INI file does *not* contain a `DateOrder` keyword. Therefore, both the job attribute and the internal Domino date formats have the value specified for the locale.

The table beginning on page 42 lists the date formats for each locale shipped with the Domino server. To specify a different value for the date format, you can set the DateOrder value in the NOTES.INI file for the server. This will change the date format Domino uses internally. However, it will not change the date format for the job attribute which affects the format of data for various OS/400 interfaces. Therefore, you need to also change the date format for the OS/400 processes for the AS/400 system.

To do this, change the Date Format (QDATFMT) system value on the AS/400 system using the *Work with System Values* (WRKSYSVAL) command to the same value that you specify for the DateOrder keyword and remove the *DATFMT value from the Locale Job Attributes setting on the QNOTES user profile by using the *Change User Profile* (CHGUSRPRF) command.

For the DateOrder value in the NOTES.INI file, specify DateOrder=xxx, where xxx is one of the following:

- DMY for day, month, year
- YMD for year, month, day
- MDY for month, day, year

Running Domino Using a Secondary Language

If the national language version (NLV) of the Domino for AS/400 software does not match the NLV of your primary language, the Domino for AS/400 language version is installed as a secondary language. To use Domino for AS/400, you must add the secondary language library to the system library list. You need to determine the feature number of the NLV for the primary language and any installed secondary languages on your system:

1. Enter the following AS/400 CL command:

   ```
   go licpgm
   ```

2. On the resulting Work with Licensed Programs menu, type **20** to display installed secondary languages.
3. On the Display Installed Secondary Languages panel, determine the primary language and the library containing each installed secondary language.

If the primary language of the system does not match the NLV of Domino for AS/400, add the secondary language library to the top of the system part of the user's library list. For details on the steps to ensure that the secondary language can be used, see the *AS/400 National Language Support*, SC41-5101 book.

Code Page Conversion Problems for the Domino Server Console

The Domino console on the AS/400 system (displayed by using the *Work with Domino Console* (WRKDOMCSL) command or the *Display Domino Console* (DSPDOMCSL) command) uses the character identifier (CHRID) of the job's device description to tag data that is entered and displayed on the console. To avoid conversion problems, such as the substitution of some characters, make sure that the CHRID for the workstation device specifies a code page that matches the code page of the Domino server. The code page used by the Domino server is based on the locale that is specified for the QNOTES user profile. To determine the locale:

1. Type this AS/400 command (do not press **Enter**):
   ```
   DSPUSRPRF QNOTES
   ```
2. Press the Page Down (**PgDn**) key until you see the line that begins:
   ```
   Locale . . . . . :
   ```

For information on what CCSID values are used for each locale, see Table 5 on page 42. For details on how CCSIDs map to code pages and how to change the CHRID of a device description, see the *AS/400 International Application Development* (SC41-5603) book.

Additional Considerations for Double-Byte Languages

The following topics only apply to languages requiring double-byte characters sets, such as Japanese, Chinese, and others.

Starting a Domino Server that Runs Under a Double-Byte User Profile

Domino server jobs on an AS/400 system run under the QNOTES user profile. If the locale specified for the QNOTES user profile has a double-byte CCSID, the job from which you start the server (by using the STRDOMSVR command) must also have a double-byte CCSID.

If you start the Domino server from a job that has a single-byte CCSID, the server is started with the single-byte CCSID instead of the double-byte CCSID specified for the QNOTES user profile. The job log of the job running under the Domino server contains a message that indicates the job CCSID was changed from the requested double-byte CCSID to the single-byte CCSID.

Using the Domino Server Console on Double-Byte Systems
The Domino console on the AS/400 system has the following limitations on systems using a double-byte character set:

- If the job CCSID is a double-byte CCSID, the **F9** key does not perform an action.
- Lowercase single-byte characters may display incorrectly on the Domino console on AS/400 systems that have the Japanese (Katakana) double-byte character set (Feature 2962) as the primary language when some 5250 emulation programs are used.

  For example, the IBM Personal Communications Workstation Program displays these characters incorrectly when running over a TCP/IP connection. To work around the problem, use one of the following alternatives:

  - Use the remote console either from a Notes client or from the Domino Web Administration tool.
  - Use an SNA APPC (LU 6.2) connection for your Personal Communications Workstation Program and specify a Host Codepage of 5035.
  - Use Graphical Access/400, a part of Client Access for AS/400, and sign on using a user profile that has a CCSID value of 5026.

Restrictions on Double-Byte Database File Names on AS/400 Systems
PC and UNIX platforms support double-byte files names for Domino databases, but Domino for AS/400 does not support double-byte file names. If you replicate a database with a file name that uses a double-byte character set from a PC or UNIX platform to AS/400, you must change the file name to a single-byte character set. Otherwise, full-text indexing cannot be created.

Setting Up the First Server in a New Domino Domain

After you have installed the Domino for AS/400 software on your AS/400 system, you can set up a Domino server. In this section, we describe the simplest scenario, a *first* server. We also recommend that you try this scenario on your AS/400 system before you attempt to implement partitioned servers (see "Configuring Partitioned Domino for AS/400 Servers" on page 90) or adding a server to an existing Domino domain (see "Configure an Additional Server in an Existing Domino Domain" on page 106).

Two methods are available to configure a Domino for AS/400 server:

- Use the *Configure Domino Server* (CFGDOMSVR) command, an OS/400 CL command. This method is sometimes referred to as the *green screen* method, since it can only be done from a 5250 terminal or display emulation session.
- Use the Operations Navigator if you prefer a graphical user interface.

In this chapter, we focus on using the AS/400 user interface to set up the server. Chapter 6 in this book explains how you can use the graphical user interface provided with Operations Navigator instead.

After describing the *Configure Domino Server* (CFGDOMSVR) command in depth, we explain briefly how to start the server and verify that it is working ("Starting the Domino for AS/400 Server" on page 75). We also describe how to transfer the administrator's ID file to your PC (see "Copy ID Files to Your Client Workstation" on page 86).

Changes with Version 4.6.2 of Domino for AS/400

Note that the sequence of parameters for the *Configure Domino Server* (CFGDOMSVR) command has changed with the Quarterly Maintenance Release (QMR) 4.6.2. The examples in this chapter are all based on version 4.6.2.

Using the Configure Domino Server (CFGDOMSVR) Command

The following steps describe the "green screen" method using the *Configure Domino Server* (CFGDOMSVR) command.

1. Sign on to the AS/400 system with a user profile that has at least the following special authorities:

***ALLOBJ**	Access to all AS/400 objects
***SECADM**	Security administrator
***JOBCTL**	Job control
***IOSYSCFG**	Device and communications configuration

2. On an AS/400 command line, type the *Configure Domino Server* (CFGDOMSVR) command and press **F4** to prompt the command. You will see the prompt as shown in Figure 10.

```
                    Configure Domino Server (CFGDOMSVR)

Type choices, press Enter.

Server name . . . . . .    AcmeDS1
                                                                  
                                                                  
Option . . . . . .         *FIRST       *FIRST, *ADD, *REMOVE

                                                                Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 10. CFGDOMSVR for a First Server - 1. Prompt

The CFGDOMSVR command supports selective, context-sensitive prompting. Depending on what keyword you enter for the OPTION parameter, different parameters will be prompted when you press **Enter**.

The following steps describe the least complicated scenario: Configuring a *first* server for a new Domino domain and organization, thus the *Public Address Book*, the *Certifier ID* file, a *User ID* file for the administrator and a *Server ID* file will be created from scratch.

Note The term "first server" has nothing to do with the fact that you are installing the first server on this AS/400 system. It only relates to the fact that a new Domino domain and organization will be created, rather than adding the new server to an existing domain.

Tips for Users with Little or No AS/400 Experience:

- This command (like most other OS/400 CL commands) provides context sensitive Help text for each parameter. Position the cursor on the parameter and press **F1**=Help.
- Once the Help document is displayed, you can press **F2**=Extended help to show Help information on the entire command rather than a single parameter.
- Position the cursor on a parameter and press **F4**=Prompt. This will show a list of possible values for this command
- If you are using an AS/400 system with a different national language support (NLS) installed, you may not be able to recognize the description of each parameter as shown in the figures and the following table. In this case, press **F11** and you will see the parameter keywords, which will not be changed when the product is translated to other languages.

Detailed Description of Command Parameters for a "First" Server

The following section guides you through all the parameters which can or must be specified when you set up (configure) the first server in a new Domino domain.

1. Fill in the following parameters in the prompt shown in Figure 10 on page 62:

Keyword	*Description*
SERVER	**Server Name** The name of your new Domino server. When you configure a first server, you just type the common name, that is, no /organization. The first 15 characters of this name must be unique across the organization. For more information, refer to "Naming the Domino Server" on page 46. Example: `AcmeDS1`
OPTION	**Option** Specifies whether you are setting up the first Domino server in a Notes domain (*FIRST), adding an additional Domino server to an existing Notes domain (*ADD), or removing a Domino server from your AS/400 (*REMOVE). Example: `*FIRST`

Tip For more information on any of the parameters, enter the command CFGDOMSVR in any AS/400 command line and press the **F4** (=Prompt) key. Then place the cursor on any one of the parameters and press the **F1** (=Help) key. To see all possible parameters independently on what was entered for the OPTION parameter, press the **F9** (=All parameters) key.

Tip Press **Enter**[11] and fill in the additional parameters as shown in Figure 11.

```
                    Configure Domino Server (CFGDOMSVR)

 Type choices, press Enter.
 Server name  . . . . . . . . . . > acmeds1
                                                                    
                                                                    
                                                                    
 Option . . . . . . . . . . . . . > *FIRST       *FIRST, *ADD, *REMOVE
 Data directory . . . . . . . . .   /notes/data
                                                                    
 Organization . . . . . . . . . .   Acme
                                                                    
Administrator:
   Last name  . . . . . . . . . . > Blankertz
                                                                    
   First name . . . . . . . . . . > Wilfried
   Middle initial . . . . . . . .   __             Character value
   Password . . . . . . . . . . .   _____________________________
   Minimum password length  . . .   8              0-31
                                                                More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

Figure 11. CFGDOMSVR for a First Server - 2. Prompt

Keyword	*Description*
DTADIR	**Data Directory** Specifies the path to the Integrated File System directory where you want the Domino data files to reside. If the specified directory does not exist, it is automatically created. Note that you cannot specify any drive letter (such as C:) here, as you would on other platforms. The hierarchy of directories is indicated by *slashes* (/), not by backslashes (\). Example: `/notes/data`
ORG	**Organization** Specifies the organization name for the Domino server. Most likely, this is the name of your company. If you are setting up the first server (as in this example), you should *not* choose the name of an existing Notes organization here. Example: Acme

[11] The contents of parameter OPTION controls which additional parameters will be prompted after you press the **Enter** key. For this example, we chose *FIRST, that is, a complete new Domino domain will be created.

Keyword	*Description*
ADM	**Administrator:** This parameter has five parts: The first name, middle initial, last name, password and minimum password length for the administrator ID to be created.
	Last name Specifies the last name of the person who is the administrator for this Domino server. This name will appear in the Server document, in the Address Book access control list (ACL), and in the USER.ID file created in the data directory (if *GEN was specified for ADMID).
	First name
	Middle initial
	Password Use the Password value to specify the administrator's password. This will also be the password protecting the certifier ID file (CERT.ID). This password is *case sensitive*.
	Minimum password length

2. Press the **PgDn**[12] key to see and fill in the next set of parameters in the prompt as shown in Figure 12.

```
                    Configure Domino Server (CFGDOMSVR)

Type choices, press Enter.

Time zone  . . . . . . . . . . .   ___             GMT,EST,CST,MST,PST,CET ...
Daylight savings time  . . . . .   *YES            *YES, *NO
Domain name  . . . . . . . . . .   *ORG
Network name . . . . . . . . . .   NETWORK1
Country ID . . . . . . . . . . .   *BLANK
Log replication events . . . . .   *YES            *YES, *NO
Log client session events  . . .   *YES            *YES, *NO
Replace configuration  . . . . .   *YES            *YES, *NO
Web browsers . . . . . . . . . .   *NONE           *NONE, *HTTP
News readers . . . . . . . . . .   *NONE           *NONE, *NNTP
Internet mail packages . . . . .   *NONE           *NONE, *ALL, *IMAP, *LDAP...
              + for more values
Advanced services  . . . . . . .   *NONE           *NONE, *ALL, *PARTITION...
              + for more values
Certifier ID . . . . . . . . . .   *GEN
_____
                                                                        More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 12. CFGDOMSVR for a First Server - 3. Prompt

[12] Whenever you see the word "More..." at the bottom right of the display, you can press the **PgDn** key to see more parameters. Do **not** press the **Enter** key at this point, since you may miss an important parameter.

Keyword	*Description*
TIMEZONE	**Time zone**[13] Specifies the time zone to be used by the Domino server.
DAYSAVTIME	**Daylight savings time** Specifies whether the server time stamp should be adjusted for daylight savings time (DST)[14]. Default: `*YES`
DOMAIN	**Domain name** Specifies the domain name for the Domino server. If you leave this parameter with the default value (*ORG), the Domino domain for the organization will be the name you entered in the *organization* (ORG) parameter. If you select another name as the Notes domain, the hierarchy of naming for users and servers will be: *user_name/organization @ domain*, where organization name and domain are different. Default: `*ORG`
NETWORK	**Network name** Specifies the name of the Domino Named Network (DNN, in prior releases called "Notes Named Network") to which this Domino server belongs. A named network identifies a group of servers that share a common protocol on the same physical network so they can communicate directly. Default: `NETWORK1`
CNTRYID	**Country ID** Specifies a two-character country ID that is added to the certifier ID for the Domino server. **Note:** this is not related to national language support. It creates an additional organizational unit to be able to distinguish user and server IDs in different countries. Default: `*BLANK`
LOGREPEVT	**Log replication events** Specifies whether the replication events should be logged in the Noteslog (LOG.NSF) for this Domino server. Default: `*YES`
LOGSSNEVT	**Log client session events** Specifies whether the client session events should be logged in the Noteslog (LOG.NSF) for this Domino server. Default: `*YES`

[13] The parameters TIMEZONE, DAYSAVTIME, LOGREPEVT, and LOGSSNEVT define settings in the NOTES.INI file. They can be changed later by editing the NOTES.INI file or by using the Notes console command SET CONFIGURATION.

[14] Domino does not adjust the AS/400 system clock, it only adjusts the time stamps internally. If the AS/400 system clock is adjusted manually to reflect DST **and** you specified `DAYSAVTIME(*YES)`, then Domino will perform an **additional** adjustment resulting in a wrong internal time stamp. If `DAYSAVTIME` is set to `*YES`, Domino assumes DST starts on the first Sunday in April and ends on the first Sunday in October. You can change these dates by editing the NOTES.INI file and adding a **DSTlaw** statement. See the information about the DST and DSTlaw statements in the administrator's Help database for more information.

Keyword	*Description*
RPLCFG	**Replace configuration** Specifies whether the existing Domino server configuration files in the directory that is specified in the Data directory (DTADIR) parameter should be erased and replaced with the new ones. These files are NOTES.INI, NAMES.NSF, and the ID files in the data directory. Default: `*YES`
WEB	**Web browsers** Specifies whether a Web server feature should be included in the Domino server configuration. The Web server feature automatically starts the Domino HTTP server and enables Web browsers to access the Domino server. Example: `*HTTP` Default: `*NONE`
NEWS	**News readers** Specifies whether an Internet news reader should be included in the Domino server configuration. A news reader enables the Domino server to send messages to and receive messages from Internet news groups. It also enables Internet news readers to access the Domino server. Example: `*NNTP` Default: `*NONE`
MAIL	**Internet mail packages** Specifies which, if any, Internet mail packages should be included in the Domino server configuration. The mail packages enable the Domino server to send mail to and receive mail from the Internet. Unless *ALL or *NONE is entered, one or more keywords can be entered. Possible Values: `*ALL *IMAP *LDAP *POP3 *SMTPMTA` Default: `*NONE`
ADVSRV	**Advanced services** Specifies which, if any, features of the Lotus Domino Advanced Services should be included in the Domino server configuration. Unless *ALL or *NONE is entered, one or more keywords can be entered. If you plan to use clustering or billing for this server, you need to select the appropriate key word. If you plan to configure multiple logical (*partitioned)* servers, you need to select *PARTITIONfor *all* servers, even if you only configure one at this time. Possible Values: `*ALL *PARTITION *BILLING *CLUSTER` Default: `*NONE`
CERTID	**Certifier ID** Specifies whether the certifier ID file by the name of `CERT.ID` should be created (*GEN) within the data directory (as defined in parameter DTADIR), or whether it already exists. Example: `*GEN` Default: `*GEN`

Press the **PgDn** key to see the next set of parameters.

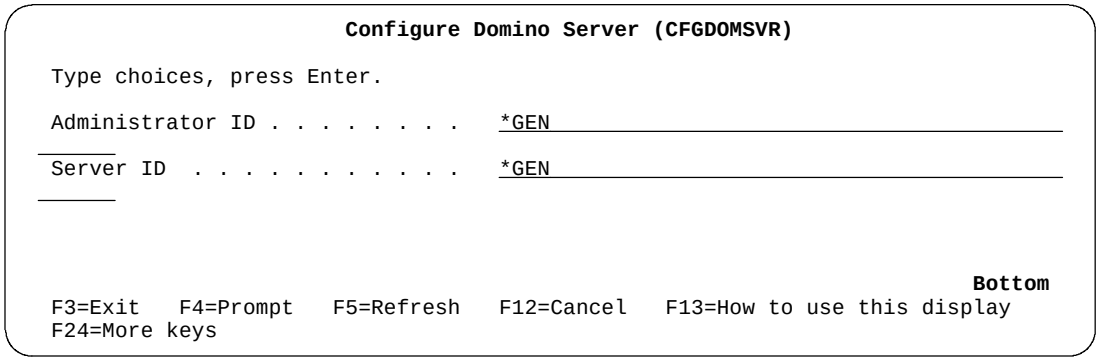

Configure Domino Server (CFGDOMSVR)
Type choices, press Enter.
Administrator ID . . . . . *GEN
Server ID . . . . . *GEN
Bottom
F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display
F24=More keys

Figure 13. CFGDOMSVR for a First Server - 4. Prompt

Keyword	*Description*
ADMID	**Administrator ID** Specifies that a new administrator ID file by the name of `USER.ID` should be created (*GEN) within the data directory (as defined in parameter DTADIR), or whether it already exists. Example: `*GEN` Default: `*GEN`
SVRID	**Server ID** Specifies the server ID file by the name of `SERVER.ID` should be created (*GEN) within the data directory (as defined in parameter DTADIR), or whether it already exists. Example: `*GEN` Default: `*GEN`

If you need to add additional selections for WEB, NEWS, MAIL or ADVSRV after the server has been configured, you can do so by reconfiguring the server, that is, by performing the *Configure Domino Server* (CFGDOMSVR) command again, but this time specifying the actual name and path for the CERT.ID, USER.ID, and SERVER.ID file in the parameters CERTID, ADMID, and SVRID as well as RPLCFG(*NO). This will just add the additional support requested in the WEB, NEWS, MAIL, or ADVSRV parameters without configuring a complete new server. See “Reconfiguring the Domino Server” on page 121.

Caution A problem was discovered recently, when configuring a server for any time zone east of Greenwich Mean Time (between ZW12 and CET) **and** specifying Daylight savings time (`DAYSAVTIME(*YES)`). In this case, the administrator’s person document was not found in the Public Address Book. To circumvent this problem, either specify `DAYSAVTIME(*NO)` or reconfigure the server without making any changes. *However, this problem is solved with Domino for AS/400 4.6.2.*

Start the Configuration Process

3. Press **Enter** to start the configuration process. Your keyboard will be locked and the display will not change for approximately 3 to 5 minutes. After that, you will see the *Terminal Session Display* as shown in Figure 14 and the keyboard will remain locked.

```
  Creating ID for Blankertz Wilfried/Acme.  This requires 1-3 minutes of
  computation...
  Begin certifying Blankertz Wilfried/Acme...
  Done certifying Blankertz Wilfried/Acme...
  Begin registering /Acme...
  Adding /Acme to the Name and Address Book...
  /Acme successfully registered.
  Begin registering AcmeDS1...
  Creating ID for AcmeDS1/Acme.  This requires 1-3 minutes of computation...
  Begin certifying AcmeDS1/Acme...
  Done certifying AcmeDS1/Acme...
  Adding AcmeDS1/Acme to the Name and Address Book...
  AcmeDS1/Acme successfully registered.
  Begin registering Team00 Admin...
  Creating mail file for Team00 Admin/Acme...
  Adding Team00 Admin/Acme to the Name and Address Book...
  Team00 Admin/Acme successfully registered.
  Press ENTER to end terminal session.

===> ____________________________________________________________________
____________________________________________________________________
 F3=Exit F4=End of File F6=Print F9=Retrieve F17=Top
```

Figure 14. Terminal Session Display for Last Phase of CFGDOMSVR

Tip The content of the Terminal Session is kept during the duration of your AS/400 job until you sign off the AS/400 system. If you perform the CFGDOMSVR command multiple times, you may see the messages of the previous runs. This may be confusing, specially when the first attempt in an error message, since you will see the error message again when you repeat the command.

Platform Independent Phase of Server Setup

You will see messages moving up the screen showing you the progress of the setup process.

During this phase, the certification keys will be created and stored in file CERT.ID. Based on this certifier, the server ID (SERVER.ID) and the administrator's ID (USER.ID) as well as the Public Address Book (NAMES.NSF) will also be created and stored in the data directory within the AS/400 Integrated File System (IFS) as specified in the DTADIR parameter (in our example this is /NOTES/DATA).

This all happens only because we selected option *FIRST, as this is the *first* server within a new domain to be configured. (See "Configure an Additional Server in an Existing Domino Domain" on page 106 for information on how to add a new server to an existing Domino domain.)

In addition, many Notes databases (.NSF files), Notes templates (.NTF files), and other files needed for this server are placed in the data directory.

Note We used `/NOTES/DATA` as the data directory for this example because this is the default directory structure used on all other platforms, so Notes administrators should be familiar with this name. However, unlike other platforms, on the AS/400 system, the top level directory (/NOTES) does not contain anything other than the data directory (/NOTES/DATA). All the program objects are stored in AS/400 libraries (QNOTES) and links to those objects are stored in common directories (/QIBM/USERDATA/LOTUS/). See "What Happens When the Domino Server Is Installed?" on page 55 for more information.

AS/400 Related Part of Server Setup

After 5 to 15 minutes (depending on the size and workload of your AS/400 system), the end of this configuration phase will be indicated by the message "*Press ENTER to end terminal session.*"

4. Press **Enter** and the (very short) final phase of the configuration will be performed. At this time, the AS/400 specific part of the configuration is done. Now, a subsystem name of the form `DOMINOxx` will be associated with the new server and the subsystem description (an object of type *SBSD) will be created in library QUSRNOTES.

   Caution The *Configure Domino Server* (CFGDOMSVR) command is **not** designed to configure multiple servers at the same time. Therefore, do not perform this command in parallel from more than one AS/400 job. If you do need to configure multiple servers, for example, while teaching a class with hands-on exercises, you *may* be successful by allowing multiple configurations up to the point when the message "Press ENTER to end terminal session" appears, but only one person at a time should perform step 6 described above.

Verify the Configuration by Checking the AS/400 Job Log

After a couple of seconds, you will see the AS/400 command line again and a message indicating the server was successfully (or not successfully) configured will be shown on the bottom of the screen or above your command line (if you use the Command Entry as shown in Figure 15.

```
                                Command Entry                        SYSTEMA
                                                                Request level:   1
Previous commands and messages:
   > CFGDOMSVR SERVER(AcmeDS1) OPTION(*FIRST)
     Command prompting ended when user pressed F3.
   > wrklnk '/notes/data'
   > CFGDOMSVR SERVER(AcmeDS1) OPTION(*FIRST) DTADIR('/Notes/AcmeDS1') ORG(ACM
     E) ADM(Blankertz Wilfried *N () 6) TIMEZONE(CST) DAYSAVTIME(*NO) ADVSRV(*
     PARTITION)
     Command CFGDOMSVR ended successfully.


                                                                        Bottom
Type command, press Enter.
===> ____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
F3=Exit   F4=Prompt   F9=Retrieve   F10=Include detailed messages
F11=Display full      F12=Cancel     F13=Information Assistant   F24=More keys
```

Figure 15. Completion Message for CFGDOMSVR Command

Even if the message indicates a successful completion of the *Configure Domino Server* (CFGDOMSVR) command, it is a good idea to check the contents of the AS/400 job log after your very first configuration. If you do see an error message, this should be the first step to start problem determination.

7. Position the cursor exactly on the completion or error message (in our example "Command CFGDOMSVR ended successfully," and press the **F1** (= Help) key. Additional information on this message will be displayed. If this is an error message, don't forget to write down the *Message ID*.

```
                        Additional Message Information

Message ID . . . . . :   LNT0997       Severity . . . . . :   00
Message type . . . . :   Completion
Date sent  . . . . . :   04/21/98      Time sent  . . . . . :   00:02:42

Message . . . . :   Command CFGDOMSVR ended successfully.
Cause . . . . . :   The command indicated ended without errors.
Recovery  . . . :   None required.

                                                                      Bottom
Press Enter to continue.

F3=Exit   F6=Print   F9=Display message details
F10=Display messages in job log   F12=Cancel   F21=Select assistance level
```

Figure 16. Completion Message of CFGDOMSVR - Additional Information

8. In order to see the information in the AS/400 job log, press the **F10** key.

```
                          Display All Messages
                                                              System:   SYSTEMA
Job . . :   QPADEV0007    User . . :   MYAS4USR       Number . . . :   041967

 >> CFGDOMSVR SERVER(AcmeDS1) OPTION(*FIRST) DTADIR('/Notes/AcmeDS1') ORG(ACME
    ) ADM(Blankertz Wilfried *N () 6) TIMEZONE(CST) DAYSAVTIME(*NO) ADVSRV(*PA
    RTITION)
    Directory created.
    Object changed.
    Object changed.
    Object changed.
    Link added.
    Link added.
    Link added.
    Link added.
    Link added.
    Object name is a directory.
    Object copied.
                                                                       More...
Press Enter to continue.

F3=Exit   F5=Refresh   F12=Cancel   F17=Top   F18=Bottom
```

Figure 17. Display the Job Log After Performing CFGDOMSVR

9. Since the job log shows very detailed information starting with the time you entered the command, it is usually helpful to show the most recent messages first by pressing **F18** (=Bottom), which is **Shift-F6** on most keyboards. The following figure shows the job log after a successful configuration.

```
                          Display All Messages
                                                              System:   SYSTEMA
Job . . :   QPADEV0007    User . . :   WBL            Number . . . :   041967

     Object copied.
     Object copied.
     Object copied.
     Object copied.
     Object copied.
     Object copied.
     Object copied.
     389 objects copied.  0 objects failed.
     Routing entry sequence number 1 already exists.
     Routing entry with compare value of *ANY already exists.
     Entry exists for job queue DOMINO07 in library QUSRNOTES.
     Object changed.
     Object changed.
     Command CFGDOMSVR ended successfully.
                                                                       Bottom
Press Enter to continue.

F3=Exit   F5=Refresh   F12=Cancel   F17=Top   F18=Bottom
```

Figure 18. Display the Job Log After Performing CFGDOMSVR - Last Entries

10. In the case of an unsuccessful configuration search for suspicious error messages, place the cursor on the message and press **F1** to see more information.

Work with Domino Servers

To find out about the status and to manage your Domino for AS/400 servers, a new command was introduced with Domino for AS/400 4.6.2: The *Work with Domino Servers* (WRKDOMSVR) command. Type the following command in any AS/400 command line:

```
WRKDOMSVR
```

You will see the *Work with Domino Servers* list panel like the one shown in Figure 19.

This command is basically the starting point to reach all AS/400 CL commands necessary to manage all Domino for AS/400 servers on your AS/400 system (without actually having to type the name) and it also shows you some important information at a glance:

- The name(s) of the subsystem(s) on your AS/400 system used to run a Domino server
- The server name related to each subsystem
- The current status (ended or started) of each server

Note that you see only one server in Figure 19; this is because only one server is configured so far. If you configure more than one logical server, that is *partitioned servers* (refer to "Configuring Partitioned Domino for AS/400 Servers" on page 90), you will see up to nine servers. Press the page down (**PgDn**) key to see more.

```
                          Work with Domino Servers
                                                              System:   SYSTEMA
Type options, press Enter.
  1=Start Domino server   5=Display Domino console   6=End Domino server
  8=Work Domino console   9=Work Domino jobs   11=Change current directory
  12=Work object links

                Domino                Domino
Opt  Subsystem  Server                Status
 __  DOMINO01   AcmeDS1               *ENDED


Parameters or command
===> ____________________________________________________________________________
F3=Exit      F4=Prompt   F5=Refresh   F9=Retrieve   F11=Display path
F12=Cancel   F17=Top     F18=Bottom   F24=More keys
```

Figure 19. Work with Domino Servers - Display Status

After pressing the **F11** key, you also get information on the name of the data directory path for each server, as shown in Figure 20.

```
                          Work with Domino Servers
                                                                System:    SYSTEMA
Type options, press Enter.
   1=Start Domino server   5=Display Domino console   6=End Domino server
   8=Work Domino console   9=Work Domino jobs   11=Change current directory
   12=Work object links

                  Domino
 Opt  Subsystem   Server                Path
  __  DOMINO01    AcmeDS1               /Notes/data



 Parameters or command
 ===> ____________________________________________________________________________
 F3=Exit      F4=Prompt   F5=Refresh   F9=Retrieve   F11=Display status
 F12=Cancel   F17=Top     F18=Bottom   F24=More keys
```

Figure 20. Work with Domino Servers - Display Path

As the name "Work with" implies, this command is not only very valuable to display information about servers, but it can also be used to perform certain actions upon each server. These actions are as follows:

- Option **1** Start the Domino server
- Option **5** Display the Domino console
- Option **6** End the Domino server
- Option **8** Work with the Domino console
- Option **9** Work with Domino jobs
- Option **11** Change the current directory to the server data directory
- Option **12** Work with object links (in the data directory)

The following sections explain some of these functions and describe how you can use them either in the *Work with Domino Servers* list panel or by entering the appropriate commands individually.

Starting the Domino for AS/400 Server

After you have verified that no error messages were logged during the server configuration, you can start the server for the first time. There are three ways to start the server:

- Use the *Work with Domino Servers* (WRKDOMSVR) command.
- Use the AS/400 CL commands directly.
- Use Operations Navigator. This method is covered in Chapter 6 of this book.

The following sections explain how to start a server using the AS/400 ("green screen") command interface.

Using the Work with Domino Servers (WRKDOMSVR) Command

In the *Work with Domino Servers* list panel, type the number **1** into the option field next to the server name you want to start as shown in Figure 21. You should see a completion message immediately; however, this does not necessarily indicate that the server was started successfully. Press **F5** (*Refresh*) repeatedly and you will see the status indicator change to *STARTING and finally to *STARTED.

```
                          Work with Domino Servers
                                                              System:   SYSTEMA
 Type options, press Enter.
   1=Start Domino server   5=Display Domino console   6=End Domino server
   8=Work Domino console   9=Work Domino jobs   11=Change current directory
   12=Work object links

                  Domino                Domino
 Opt  Subsystem   Server                Status
  1   DOMINO01    AcmeDS1               *ENDED


 Parameters or command
 ===> ____________________________________________________________________________
 F3=Exit      F4=Prompt   F5=Refresh   F9=Retrieve   F11=Display path
 F12=Cancel   F17=Top     F18=Bottom   F24=More keys
Starting Domino server ACMEDS1 in subsystem DOMINO01.
```

Figure 21. Work with Domino Servers - Start a Server

Using the Start Domino Server (STRDOMSVR) Command

To start a Domino for AS/400 server from the AS/400 command line, use the *Start Domino Server* (STRDOMSVR) command. To do so, perform the following steps:

1. Type the following command in any AS/400 command line and press the **F4** key:

   STRDOMSVR

   You will see the prompt for the *Start Domino Server* (STRDOMSVR) command as shown in Figure 22. This command needs one parameter: Server name (SERVER).

```
                        Start Domino Server (STRDOMSVR)

 Type choices, press Enter.

 Server name  . . . . . .  ____________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________


                                                                  Bottom
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

Figure 22. Prompt Panel for STRDOMSVR Command

2. The command prompt allows you to see a list of all configured Domino servers on your AS/400 system. To do so, make sure your cursor is placed in the input field for the server name (the underlined area) and press the **F4** (=Prompt) key. You will see a list of configured Domino servers underneath the underlined input area (shown in bold in Figure 23).

```
                Specify Value for Parameter SERVER

Type choice, press Enter.

Type . . . . . . . . . . . . . :   CHARACTER
Server name  . . . . . . . . . .   ____________________________________________
_____________________________________ ...
AcmeDS1

F3=Exit   F5=Refresh   F12=Cancel   F13=How to use this display   F24=More keys
```

Figure 23. Field Prompt for the Server Parameter

3. Enter your server name and press the **Enter** key to return to the command prompt shown in Figure 22. Press **Enter** again to actually execute the *Start Domino Server* (STRDOMSVR) command.

   The STRDOMSVR command will submit a new AS/400 job which runs independently of your interactive job. Therefore, you will return to the command line very quickly. You should see a completion message on the bottom of your screen.

   The completion message shown in Figure 24 (LNT0925) provides you with important information about your new Domino server: the name of the subsystem the server will be running in.

```
MAIN                              AS/400 Main Menu
                                                          System:   SYSTEMA
 Select one of the following:

      1. User tasks
      2. Office tasks
      3. General system tasks
      4. Files, libraries, and folders
      5. Programming
      6. Communications
      7. Define or change the system
      8. Problem handling
      9. Display a menu
     10. Information Assistant options
     11. Client Access/400 tasks

     90. Sign off

 Selection or command
 ===>  ____________________________________________________________________

 F3=Exit    F4=Prompt    F9=Retrieve    F12=Cancel    F13=Information Assistant
 F23=Set initial menu
 Starting Domino server ACMEDS1 in subsystem DOMINO01.
```

Figure 24. Completion Message for Start Domino Server (STRDOMSVR)

4. If you see an error message instead, use the **F1** and then the **F10** key (as described in "Verify the Configuration by Checking the AS/400 Job Log" on page 71) to check the job log for the reason of the error.

Starting the Domino for AS/400 Server Automatically After IPL

If you want to start the Domino server automatically after each OS/400 Initial Program Load (IPL), you need to modify the startup program defined in the system value QSTRUPPGM.

Ending the Domino Server

Similar to starting a Domino server, you have several ways to end a server:

- Use option 6 of the *Work with Domino Servers* (WRKDOMSVR) command.
- Use the *End Domino Server* (ENDDOMSVR) command.
- Use Operations Navigator. This method is covered in Chapter 6 of this book.

Alternatively you may also end any Domino server using the console command **`quit`** or **`exit`** from the *Work with Domino Console* (WRKDOMCSL) command line or a remote Domino console from an authorized Notes client.

Important Keying the command **`exit`** is **not** the same as pressing the **F3** key, which is also described in the help line as **F3=Exit**. F3 ends the console rather than the entire server.

Ending the Domino Subsystem

With early releases of the product, the DOMINOxx subsystem was also ended after all servers tasks terminated. This behavior changed with the first QMU and later releases of Lotus Domino for AS/400.

Caution Do **not** end the Domino subsystem using the *End Subsystem* (ENDSBS) while the server is still active. This may cause the server to restart immediately after the *End Domino Server* (ENDDOMSVR) command has been executed.

Identify the AS/400 Jobs for Your Server

The completion message shown in Figure 24 is no guarantee that the server jobs have actually been started. For example, if the AS/400 system has been set to *restricted mode* (using the ENDSYS or ENDSBS *ALL commands), you may be able to successfully run the STRDOMSVR command and the necessary jobs have been submitted to a job queue, but they will not start until the system has been started again (either by performing an IPL or by starting the controlling subsystem again).

If you have Domino 4.62 or higher installed, the fastest way to find out if the server jobs are actually running is to use the *Work with Domino Servers* (WRKDOMSVR) command and press the F5 (=Refresh) key until the status shows *STARTED. Then type option **9** (Work Domino jobs) into the input field in the line showing the name of your server and press **Enter**.

```
                            Work with Active Jobs                    SYSTEM01
                                                          07/05/98  11:48:10
CPU %:     .3     Elapsed time:   00:00:29     Active jobs:   218

Type options, press Enter.
  2=Change   3=Hold   4=End   5=Work with   6=Release   7=Display message
  8=Work with spooled files   13=Disconnect ...

Opt  Subsystem/Job  User        Type  CPU %  Function        Status
__   DOMINO01       QSYS        SBS      .0                  DEQW
__     AMGR         QNOTES      BCI      .0                  TIMW
__     CALCONN      QNOTES      BCI      .0                  DEQW
__     EVENT        QNOTES      BCI      .0                  TIMW
__     QNNINSTS     QNOTES      BCH      .0  PGM-QNNINSTS    EVTW
__     REPLICA      QNOTES      BCI      .0                  TIMW
__     REPORT       QNOTES      BCI      .0                  TIMW
__     ROUTER       QNOTES      BCI      .0                  TIMW
__     SCHED        QNOTES      BCI      .0                  TIMW
                                                                    More...
Parameters or command
===> ____________________________________________________________________
F3=Exit   F5=Refresh       F7=Find      F10=Restart statistics
F11=Display elapsed data   F12=Cancel   F23=More options   F24=More keys
```

Figure 25. Work with Domino Jobs

You will see the *Work with Active Jobs* display as shown in Figure 25. This panel shows similar information to the one based on the *Work with Subsystem Jobs*

shown in Figure 27 on page 81. However, the *Work with Active Jobs* (Figure 25) displays additional information when you press the **F11** key.

As an alternative (or if you do not have Domino 4.62 installed yet) you can use the *Work with Subsystems* (WRKSBS) command. To do so, perform the following steps:

1. Type the following command on any AS/400 command line:

   `WRKSBS`

   and press **Enter**. You will see all *active* subsystems on your system. Note that there may be more and different subsystems on your system than those shown in Figure 26.

```
                              Work with Subsystems
                                                                System:   SYSTEM01
Type options, press Enter.
  4=End subsystem   5=Display subsystem description
  8=Work with subsystem jobs

                     Total     -----------Subsystem Pools------------
Opt  Subsystem   Storage (K)   1   2   3   4   5   6   7   8   9  10
 _   DOMINO08              0    2
 _   QBATCH                0    2
 _   QCMN                  0    2
 _   QCTL                  0    2
 _   QINTER                0    2   4
 _   QSERVER               0    2
 _   QSNADS                0    2
 _   QSPL                  0    2   3
 _   QSYSWRK               0    2

                                                                        Bottom
Parameters or command
===> ____________________________________________________________________________
F3=Exit   F5=Refresh   F11=Display system data   F12=Cancel
F14=Work with system status
```

Figure 26. Work with Subsystems (WRKSBS)

2. Watch for the subsystem name used by your new Domino for AS/400 server. It is a name in the form `DOMINOxx` that you wrote down from the completion message shown in Figure 24 on page 77. Type the number **8** (=Work with subsystem jobs) into the *option* field next to the correct subsystem name and press Enter. You will see the *Work with Subsystems Jobs*[15] panel (Figure 27).

Depending on the configuration of your server and how soon you entered this command after starting the server, you may see more or fewer jobs compared to those shown in Figure 27. However, at least two jobs *must* be active: **QNNINSTS** and **SERVER** (to see the latter, you may have to press the **PgDn** key).

---

[15] If you know the name of the subsystem, there is also a fast path to this point: Just enter command WRKSBSJOB DOMNINOxx on any command line.

```
                          Work with Subsystem Jobs                  SYSTEM01
                                                              04/22/98  01:47:37
Subsystem  . . . . . . . . . . :   DOMINO08

Type options, press Enter.
  2=Change   3=Hold   4=End   5=Work with   6=Release   7=Display message
  8=Work with spooled files   13=Disconnect


Opt  Job         User        Type     -----Status-----  Function
__   ADMINP      QNOTES      BATCHI   ACTIVE
__   AMGR        QNOTES      BATCHI   ACTIVE
__   AMGR        QNOTES      BATCHI   ACTIVE
__   BILLING     QNOTES      BATCHI   ACTIVE
__   CALCONN     QNOTES      BATCHI   ACTIVE
__   EVENT       QNOTES      BATCHI   ACTIVE
__   QNNINSTS    QNOTES      BATCH    ACTIVE            PGM-QNNINSTS
__   REPLICA     QNOTES      BATCHI   ACTIVE
                                                                  More...
Parameters or command
===> ____________________________________________________________________
F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F11=Display schedule data
F12=Cancel
```

Figure 27. Work with Subsystem Jobs (WRKSBS, option 8)

If you only see the QNNINSTS job, press the **F5** (=Refresh) key in case the SERVER job is still being started. If the SERVER job does not appear within 5 minutes or if it comes up shortly and disappears again[16], you may use option **5** (=Work with) with the QNNINSTS job, then option **10** (Display job log). Press **F10** (=Display detailed messages) to search for error messages.

Tip If you see no other jobs besides QNNINSTS and SERVER for more than 2 or 3 minutes, you may be using a password protected server ID file. In that case, the server is waiting for the password to be entered through the Domino console. See "Working with the Domino Console" on page 81 to learn how to access the Domino console.

Working with the Domino Console

After verifying that all jobs making up the Domino for AS/400 server have actually been started, you can use the *Work with Domino Console* (WRKDOMCSL) command from any AS/400 workstation to verify whether the basic server functions are working.

1. In any AS/400 command line, type the following command and press **Enter**:

   `WRKDOMCSL ACMEDS1`

   where ACMEDS1 should be replaced by the name of your server. You can also use prompting to show the valid server names as explained for the STRDOMSVR command (see the description following Figure 22 on page 76).

[16] The job QNNINSTS is the "watch dog"; that is, this job controls all server functions. If one of them fails, QNNINSTS will try to bring down all other functions and then restart the server again. If the error condition persists, this may happen up to 10 times (unless configured otherwise) before QNNINSTS also terminates.

2. You will see the Domino Console, which looks similar to the screen below:

```
                        Work with Domino Console
                                                    Server: AcmeDS1
Previous subcommands and messages:
   04/22/98 01:03:14 AM  Warning: Cannot locate design template 'Online Doc R4
   template' used by 'Java Programmer's Guide'
   04/22/98 01:03:18 AM  Warning: Cannot locate design template 'Standalone
   R4.2 protoprint' used by 'Java Programmer's Guide'
   04/22/98 01:03:22 AM  Warning: Cannot locate design template 'Online Doc R4
   template' used by 'Java Programmer's Guide'
   04/22/98 01:03:26 AM  Database Designer shutdown
   04/22/98 01:26:54 AM  Periodic full text indexer starting, performing hourly
   full text indexing
   04/22/98 01:26:56 AM  Periodic full text indexer terminating
   04/22/98 01:31:18 AM  The Administration Request database - admin4.nsf - on
   vieasfsc/wrkshp is currently a wildcard replica.
   04/22/98 01:31:18 AM  The Administration Process on AcmeDS1/wrkshp will not
   work until an Administration Server has been designated for this domain's
   Public Address Book.
 Enter a Domino subcommand.
 ===> ____________________________________________________________________________

 F3=Exit   F5=Refresh   F6=Print   F9=Retrieve
 F17=Top   F18=Bottom   F21=Command line
```

Figure 28. Work with Domino Console (WRKDOMCSL)

The messages shown in Figure 28 are probably different from those you will see on your system. What you will see are the most recent messages logged by the Domino server[17]. If you started the server for the very first time, it is a good idea to look at all the messages, beginning at the point when you started the server.

3. Press the **F17** (=Top) key (for most workstations, this is **Shift F5**) to see the oldest messages of the Domino console as shown in Figure 29.

[17] Note that this is *not* an AS/400 job log.

```
                        Work with Domino Console

Previous subcommands and messages:

  Lotus Domino (tm) Server, Release 4.6b (Intl), 20 February 1998
  Copyright (c) 1985-1998, Lotus Development Corporation, All Rights Reserved

  04/22/98 02:10:06 AM  Billing started
  04/22/98 02:10:12 AM  Database Replicator started
  04/22/98 02:10:17 AM  Mail Router started for domain ACME
  04/22/98 02:10:17 AM  Router: Internet SMTP host SYSTEMA.ACME.COM in domain
     ACME.COM
  04/22/98 02:10:22 AM  Index update process started
  04/22/98 02:10:28 AM  Stats agent started
  04/22/98 02:10:39 AM  Agent Manager started
  04/22/98 02:10:39 AM  No Administration Server has been designated for the
  Public Address Book.
  04/22/98 02:10:39 AM  Administration Process started
Enter a Domino subcommand.
===> ____________________________________________________________________________

F3=Exit   F5=Refresh   F6=Print   F9=Retrieve
F17=Top   F18=Bottom   F21=Command line
```

Figure 29. Work with Domino Console - Top Page

4. Press the **PgDn** key to page through all the messages and check for potential problems.

5. You can type some Domino console commands; for example, **show server** or **show Tasks,** and press **Enter**. Wait a couple of seconds and press the **F5** (=Refresh) key to see the response.

6. It is a good idea at this point to verify whether the server is actually listening to an IP interface. You can do so in two ways:

   - Use the Notes command **show port tcpip**.
   - Use the OS/400 interface, and issue the *Work with TCP/IP Network Status* (WRKTCPSTS) command, also known as NETSTAT, along with the parameter *CNN or menu selection **3**.

7. Since you are already looking at the Domino console, the Notes command may be most convenient at this time. Type the following command into the Domino command line and press **Enter**:

   `sh port tcpip` (sh is a short form for show)

   Wait a couple of seconds and press the **F5** (=Refresh) key to see the response.

   Note If you started the server and then immediately started working with the console, it may take longer for the server to respond to your command. Press **F5** repeatedly and you will see more informational messages telling you what functions are being started, until you finally see the command that you entered (with a greater than sign (>) on the left and 2 spaces indented) and the response to it. The example in Figure 30 shows two lines with the **sh port**

tcpip command. The first one is displayed immediately after being entered, and the second one appears together with the response. If the server is very busy, there may be many informational messages shown between both commands.

```
                          Work with Domino Console

Previous subcommands and messages:
  replication from AcmeDS2 AS4FOR98.NSF
  04/24/98 01:38:16 PM  Finished replication with server AcmeDS2
  04/24/98 01:50:00 PM  Periodic full text indexer starting, performing hourly
  full text indexing
  04/24/98 01:50:04 PM  Periodic full text indexer terminating
  04/24/98 01:54:12 PM  Searching Administration Requests database.
> sh port tcpip

  > sh port tcpip
  TCP/IP Port Driver
   Transport Provider: TCP

  Notes Session    Local Address         Foreign Address
  1ECA0001               *.1352                 *.*

Enter a Domino subcommand.
===> ____________________________________________________________________________

F3=Exit   F5=Refresh   F6=Print   F9=Retrieve
F17=Top   F18=Bottom   F21=Command line
```

Figure 30. Show TCP/IP Port Status on the Domino Console

The response (Local Address = *.1352) indicates that the Domino server is listening to all (*) local IP interfaces on port 1352 (the default for Notes clients).

If you see only the first two lines (TCP/IP Port Driver - Transport Provider: TCP), it indicates that the Domino server is not able to connect to OS/400 TCP/IP. This can have many causes:

- TCP/IP Support for OS/400 was not configured or not started.
- The TCP/IP interface is not active.
- Another application already listens to port 1352.
- A (partitioned) Domino server was already started and is listening to all interfaces (see “Verify the Server Is Listening to Only One IP Address” on page 96 for more information).

8. Press **F3** to **Exit** the Domino console. Do **not** type the **Quit** command unless you want to end the server session. **F3** just ends the Domino console, but leaves the server running.

Verify TCP/IP Connectivity for Your Administration Client

Once you know that the Domino for AS/400 server is listening to an AS/400 IP interface, make sure that TCP/IP on the administration client workstation is able to connect to that interface on your AS/400 system. This can be done by performing the following steps:

1. **PING by Address:** Verify the connection by IP address. Use the following command in a command line on your workstation (not in an AS/400 command line) to find out if the AS/400 system responds to your connection attempt using the numerical TCP/IP address (10.1.2.3 in our example):

   ```
   ping 10.1.2.3
   ```

   You should see a response similar to the example in Figure 31:

```
C:\WINDOWS>ping 10.1.2.3

Pinging 10.1.2.3 with 32 bytes of data:

Reply from 10.1.2.3: bytes=32 time=4ms TTL=254
Reply from 10.1.2.3: bytes=32 time=4ms TTL=254
Reply from 10.1.2.3: bytes=32 time=4ms TTL=254
Reply from 10.1.2.3: bytes=32 time=4ms TTL=254

C:\WINDOWS>
```

Figure 31. Ping by Address

   If you see an error message instead, correct your TCP/IP configuration on either the AS/400 system or the workstation. It is beyond the scope of this book to explain the details and different possibilities of TCP/IP configuration. Here are a couple of tips:

   - Try to ping in the opposite direction; that is, from your AS/400 system to your workstation. If this works, repeat testing the other direction again.
   - Try to ping to other systems in your network, first from your workstation and, if that works, from your AS/400 system. This may isolate where the problem is - in the AS/400 configuration or the workstation.
   - If you still cannot isolate the source of the problem, try to ping the “loop back” interface:

     ```
     ping 127.0.0.1
     ```

     If this is not successful on either the AS/400 system or your workstation, it indicates that TCP/IP was not set up or started, or that it may have been configured incorrectly.

2. **PING by Host Name:** If you were able to successfully ping from your workstation to the AS/400 system using the numerical address, you should now try to ping by using the host name, that is, the Domino server name:

```
ping acmeds1
```

Note You must be able to ping by specifying the Domino server name. If the name of the AS/400 system is different from the name of the Domino server, it is not enough to ping the host name of the AS/400 system. Also, you must specify the *simple* name only, that is, being able to ping acmeds1.acme.com does not indicate that the Notes client can reach the server acmeds1. The server and the workstation may be in different subnetworks.

After having verified the TCP/IP connection between your client and the Domino server running on the AS/400 system, you may proceed to the next section.

Copy ID Files to Your Client Workstation

Domino uses *ID files* to secure the clients' access to servers. Every Domino server and Notes user must have an ID. An ID is a unique binary file that identifies a legal Domino server and Notes user. IDs are created at the time of user or server registration. An ID file contains:

- The hierarchical name of its owner.
- A license number that indicates that the owner uses a legal Lotus Notes license and specifies whether the owner can run the North American or International edition of Domino or Notes. You can't change a license number associated with an ID.
- A public key and a private key.
- At least one certificate from a certifier ID. A certificate is an electronic stamp added to a user ID or server ID. This stamp is generated using the private key of a certifier ID and verifies that the name of the owner of the ID is correctly associated with a specific public key.
- (Optional) One or more encryption keys, created and distributed by users that allow users to encrypt and decrypt fields in a document.

If the owner of an ID creates a password for it, the password generates a key that encrypts most of the data on the ID.

When the first server is configured, three ID files are created and stored in the specified data directory. The names of those ID files are:

- cert.id
- user.id
- server.id

The **cert.id** file contains the organization certifier ID and is the base to create IDs for any users, servers, or certifiers for organizational units within the same organization. Therefore, you need access to the cert.id file from a Notes client (the "administration client") whenever you want to register additional users or servers.

The **user.id** file is the administrator's ID file. After having configured the first server of an organization, the administrator is the only user registered in the Public Address Book.

In order to register additional users or servers to perform administration functions, or simply to test the server functions from a Notes client, the ID files cert.id and user.id must be copied from the AS/400 Integrated File System (IFS) to the administrator's client workstation.

If the workstation already has a Notes Client installed, take care not to overwrite any ID files already stored there. The user ID files are typically named user.id and are stored in the \Notes\Data directory. Either copy the files to another directory (for example, \Notes\Data*ServerName*\) or rename the files with unique names; for example, admin.id.

The **server.id** is used to identify the server. It should be kept in the data directory assigned to that server.

There are several methods of copying the ID files to and from the AS/400, for example:

- Use the File Transfer Protocol (FTP), which is a part of OS/400 TCP/IP programs.
- Use the Windows Network Neighborhood in combination with Client Access for Windows 95/NT or AS/400 NetServer support to access the AS/400 IFS as a network drive.

Using FTP to Copy the ID Files to the Administrator Workstation

The book *Installing and Managing Domino for AS/400*, Part No. 12999 (as well as its online version as400doc.nsf) has an example[18] using FTP to copy the ID files. Figure 32 shows the same example as seen from the administrator's workstation. The lines shown in bold are the commands to be entered, the normal text is the system output.

[18] See topic "*Examples: Using FTP to copy the ID files to the administrator workstation*."

```
C:\WINDOWS>cd \

C:\>md notes\idfiles

C:\>md notes\idfiles\server1

C:\>cd notes\idfiles\server1

C:\notes\idfiles\server1>ftp system01
Connected to system01.
220-QTCP at SYSTEM01.
220 Connection will close if idle more than 5 minutes.
User (system01:(none)): myas4usr
331 Enter password.
Password:
230 MYAS4USR logged on.
ftp> bin
200 Representation type is binary IMAGE.
ftp> cd /
250-NAMEFMT set to 1.
250 Current directory changed to /.
ftp> cd /notes/data
250 Current directory changed to /notes/data.
ftp> get cert.id
200 PORT subcommand request successful.
150 Retrieving file /notes/data/cert.id
250 File transfer completed successfully.
2113 bytes received in 0.22 seconds (9.60 Kbytes/sec)
ftp> get user.id
200 PORT subcommand request successful.
150 Retrieving file /notes/data/user.id
250 File transfer completed successfully.
2423 bytes received in 0.16 seconds (15.14 Kbytes/sec)
ftp> quit
```

Figure 32. Example for Using FTP to Transfer ID Files

Tip The line **cd /** is very important. It not only changes the current directory to the root of the IFS (from whatever is specified as the home directory in your AS/400 user profile), it also switches to name format 1[19]. This is necessary to access any IFS directories other than QSYS.LIB.

Installing the Administrator's Workstation

To use the capabilities of a Lotus Notes workstation to administer the Domino server, you must set up the workstation with the Lotus Notes client software. Make sure you install the full set of administrative functions (called Notes Designer for Domino 4.6). You can also use Notes client software with an earlier release than 4.6, but some administrator functions may not be supported.

---

[19] This happens only when you mention an object name (in this case, the root directory /) for the very *first* time during an FTP session to AS/400 **and** the object name starts with a slash (/). Typing anything different would cause FTP to remain in name format 0, which means you can only refer to objects in QSYS.LIB. If you do not see the message "250-NAMEFMT set to 1.," you can manually switch to name format 1 by entering the following command: quote site namefmt 1

To install the Notes client 4.6 from the Lotus Notes CD-ROM[20] on a Windows 95 or Windows NT workstation, you usually need to run the following program:

```
E:\Notes_r4_ie\Client\W32INTEL\INSTALL\Install.exe
```

However, the path may change in future releases of the software. Refer to the *Install Guide for Workstations (Notes 4.5)* or *Lotus Notes Install Guide (Notes 4.6)* for more information on how to install the client software.

To make sure that you install the full version of the software, select "Notes Designer for Domino" in the Install Options dialog box as shown in Figure 33. this is *not* the default.

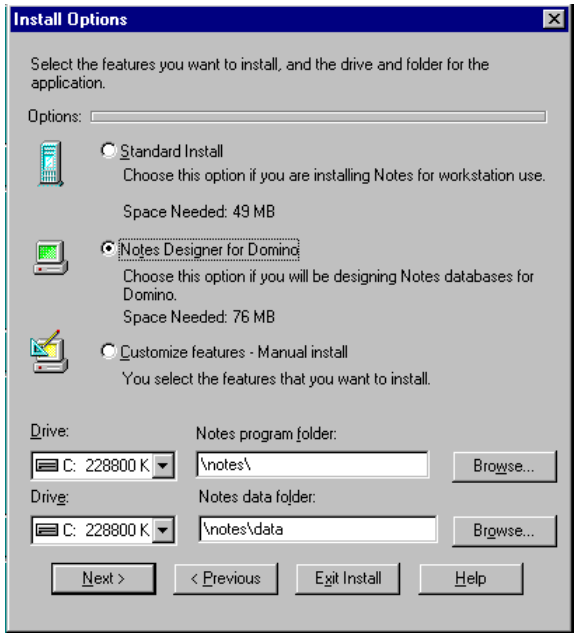


Figure 33. Install Options for Lotus Notes Client

[20] The CD-ROM containing Domino for AS/400 4.6 does *not* contain the Notes client code, but a different CD-ROM containing the client code will be part of the product package. However, the license is restricted to administration purposes only.

After completing the installation, you may want to start the Notes client[21]. If you do start the Notes client, the dialog box shown in Figure 34 indicates that the program was started for the very first time.

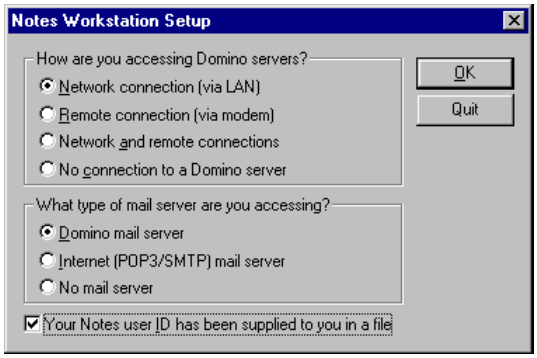

Notes Workstation Setup
How are you accessing Domino servers?
Network connection (via LAN)
Remote connection (via modem)
Network and remote connections
No connection to a Domino server
What type of mail server are you accessing?
Domino mail server
Internet (POP3/SMTP) mail server
No mail server
Your Notes user ID has been supplied to you in a file
OK
Quit

Figure 34. Notes Workstation Setup

Since you need to use the new server administrator's user ID (which you downloaded as described in "Copy ID Files to Your Client Workstation" on page 86), select "Your Notes User ID has been supplied to you in a file" and click **OK**.

When you are prompted to type the name of your ID file, select the file user.id from the directory on your PC you copied it to. The password is the one you specified in the last part of parameter ADM of the CFGDOMSVR command (Figure 11 on page 64).

Tip Remember, the password is case sensitive. Check the status of your **Caps Lock** key!

After completing the remaining steps of the setup for your administration workstation, use the Domino server in the same way as any other platform.

The following sections cover more complex topics, such as configuring multiple logical servers (see "Configuring Partitioned Domino for AS/400 Servers" page 90) and integrating a new Domino for AS/400 server with an existing Notes or Domino environment (see "Configure an Additional Server in an Existing Domino Domain" on page 106).

Configuring Partitioned Domino for AS/400 Servers

Domino for AS/400 supports partitioned servers on the same AS/400 system. This function allows you to operate multiple logically distinct servers, even representing different Notes domains, on the same AS/400 system. A Lotus Domino Advanced

[21] In some cases, you might also be asked to boot your PC before you start the Notes client for the first time.

Services license is needed to use partitioned servers. Domino Release 4.6 supports partitioned servers only on AS/400, UNIX and Windows NT operating systems.

To be able to use partitioned servers on the AS/400 system, you must do the following:

1. Select Advanced Services (product option **7**) when you run the *Load and Run* (LODRUN) command.
2. Set up all Domino servers on the AS/400 system as partitioned servers.

   When you use the *Configure Domino Server* (CFGDOMSVR) command to set up a Domino server, you must specify either *ALL or *PARTITION for the "Advanced services" (ADVSRV) parameter. If you have already set up a single, non-partitioned server, you need to reconfigure this server in order to include the support for partitioned servers (see "Reconfiguring the Domino Server" on page 121).

   Tip If you see message LNT0109 ("Maximum number of servers exceeded"), this does not necessarily mean that you already configured 16 servers. This message also comes up if you did not configure partitioning support. To tell if an existing server was configured as partitioned, do one of the following:

   - Check the server's NOTES.INI for **NPN=1**

     or

   - Check for the existence of .sgf.notespartition (the name starts with a period!) in the server data directory (`/notes/data` in our example):

     ```
     wrklnk '/notes/data/.sgf.notespartition'
     ```

     If the file .sgf.notespartition does not exist within the data directory, this server was not set up as a partitioned server.

   Note Each partitioned server needs to have its own data directory. To avoid confusion, it is a good idea to use the name of the Domino server as the directory name in one level of the hierarchy. For example, using the convention /notes/server would have all the data directories under the main directory called /notes.
3. Before starting any of the partitioned servers for the first time, the NOTES.INI file needs to be modified, to define which IP address and port each server is listening to and if a port mapper should be used.

Two Options to Set Up Partitioned Servers for TCP/IP Connections

From the Notes client workstation point of view, two partitioned servers look like two different systems, that is, two different IP hosts. From the AS/400 system TCP/IP configuration point of view, there are two different ways to implement partitioned servers:

- Each server has its own IP address. If the servers use the same AS/400 communication adapter, you need to assign more than one IP interface to the same line description. Each server must appear with its correct IP address on a name server (DNS) or the clients' host table. (See the topic called "Configuring partitioned servers with unique IP addresses" in the *Domino Administration Help* database (doc\helpadmn.nsf) or the *Extend the Domino System* book).
- All servers running on the AS/400 system use the same IP address. Unique port numbers are used to distinguish between each partitioned server. (See the topic called "Configuring partitioned servers using unique TCP/IP port numbers" in the *Domino Administration Help* database (doc\helpadmn.nsf) or the *Extend the Domino System* book).

Each method needs some additional configuration steps. They are described in the following sections.

Each Partitioned Server has its Own IP Address

For each partitioned server on the same AS/400 system, you need to perform the following steps:

1. Assign and configure a unique IP address for the server.
2. Run the *Configure Domino Server* (CFGDOMSVR) command.
3. Modify the NOTES.INI file for this server by adding a statement defining the IP address and port (typically the default 1352) to be used by this server.
4. Start the server using the Start Domino Server (STRDOMSVR) command.
5. Verify the server is listening to only one IP address.

The following topics describe each step.

Assign and Configure a Unique IP Address for Each Server

A unique IP address needs to be assigned to each partitioned server and defined in the OS/400 TCP/IP configuration. Since the AS/400 TCP/IP implementation supports *multi homing*, you may use the same line description for more than one IP interface[22]. However, if you have more than one communications adapter (for example, one Token Ring and one Ethernet), each physical adapter is represented by one line description and the IP addresses may be assigned to different line descriptions.

For example, we assign the following names and IP addresses to three partitioned servers:

DOM4SVR1	10.1.2.217
DOM4SVR2	10.1.2.218
DOM4SVR3	10.1.2.219

[22] The maximum number of IP addresses that can be assigned to one line description is 128, while the total number of IP interfaces on the entire AS/400 system cannot exceed 512.

Assuming that you want to use the same physical Token Ring line of the AS/400 system, you need to add all three interfaces to the appropriate line description, either by using the *Configure TCP/IP* (CFGTCP) menu option **1** (*Work with TCP/IP interfaces*) and then option **1**(=Add); or by entering the *Add TCP/IP Interface* (ADDTCPIFC) command on any AS/400 command line. You will see a prompt, as shown in Figure 35.

```
                    Add TCP/IP Interface (ADDTCPIFC)

Type choices, press Enter.

Internet address . . . . . > '10.1.2.217'
Line description . . . . . > TRNLINE      Name, *LOOPBACK
Subnet mask  . . . . . > '255.255.255.192'
Type of service  . . . . . *NORMAL      *MINDELAY, *MAXTHRPUT...
Maximum transmission unit  . . .  *LIND        576-16388, *LIND
Autostart  . . . . . *YES           *YES, *NO
PVC logical channel identifier      ___           001-FFF
             + for more values      ___
X.25 idle circuit timeout  . . .  60____         1-600
X.25 maximum virtual circuits  .  64____         0-64
X.25 DDN interface . . . . . *NO            *YES, *NO
TRLAN bit sequencing . . . . . *MSB           *MSB, *LSB

                                                                    Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
```

Figure 35. Add TCP/IP Interface (ADDTCPIFC) Prompt Panel

Only the first three parameters of the *Add TCP/IP Interface* (ADDTCPIFC) command are mandatory. For more information on configuring TCP/IP on the AS/400 system, see Chapter 3 of the book *TCP/IP Fastpath Setup*, SC41-5430. For more in-depth information on the TCP/IP support and TCP/IP applications on the AS/400 system, see *TCP/IP Configuration and Reference*, SC41-5420.

Run the Configure Domino Server Command for Partitioning

Make sure that, when setting up the server, you specify either *ALL or *PARTITION for the Advanced Services (ADVSRV) parameter. If any Domino server was already set up on the AS/400 system without specifying this parameter, you need to reconfigure the server, that is, run the *Configure Domino Server* (CFGDOMSVR) command again.

Modify the NOTES.INI File for the Partitioned Server

Before the server can be successfully started, the IP address to be used must be defined in the NOTES.INI file by adding the following statement:

```
TCPIP_TcpIpAddress=0,10.1.2.217:1352
```

The number 10.1.2.217 is this server's IP address. Note that 1352 is the standard port number used by Notes clients and servers to connect to a server. The name TCPIP at the left of the underscore (_) is the standard name for the TCP/IP port within the NOTES.INI file.

The NOTES.INI file was created when you performed the *Configure Domino Server* (CFGDOMSVR) command; it is stored as a stream file containing ASCII text characters in the IFS directory you specified for the Data directory (DTADIR) parameter.

The NOTES.INI file can be edited using one of the following methods:

- From an AS/400 interface, use the new *Edit File* (EDTF) command. Remember that, in order to use this command, you need to apply PTF SF45296 and follow special instructions (see "Apply and Activate the PTF to Support EDTF and DSPSTMF" on page 41).

  Tip When you use the *Work with Domino Servers* (WRKDOMSVR) command, you can use option **11** to change your current directory to the server's data directory. After that, enter the following command in the command line to edit the NOTES.INI file:

  ```
  EDTF notes.ini
  ```

  You don't need to remember and type the full path of the data directory.

- From a Client Access/400 client having the IFS directory assigned as virtual drive (mapped network drive), use a PC-based text editor.

  Tip Do **not** use the NotePad editor. The line ends are marked differently by NotePad than what is expected by the Domino server.

  Important After saving the file, you need to change the ownership of the IFS object so that QNOTES owns it again. This can be done using the *Change Owner* (CHGOWN) command. For example, enter the following command on any AS/400 command line:

  ```
  CHGOWN OBJ('/notes/data/notes.ini') NEWOWN(QNOTES)
  ```

- Use File Transfer Protocol (FTP) to copy the NOTES.INI file to a workstation, then modify it with a PC editor and copy it back to the AS/400 IFS.

  Important After copying the file back to the AS/400 IFS, you need to change the ownership of the IFS object so that QNOTES owns it again. This can be done using the *Change Owner* (CHGOWN)[23] command. For example, enter the following command on any AS/400 command line:

  ```
  CHGOWN OBJ('/notes/data/notes.ini') NEWOWN(QNOTES)
  ```

- Open the server properties with Operations Navigator and click the tab called "Initialization File." You will see the contents of the NOTES.INI file. Then, click the "Edit" button.

  Tip When you click the Edit button, the Windows 95 application WordPad will be started. You will see an error message if WordPad is not installed on your PC. To install WordPad, perform the following steps on your Windows 95 desktop:

[23] You cannot use the *Change Object Owner* (CHGOBJOWN) command here.

1. Double-click **My Computer**.
2. Double-click **Control Panel**.
3. Double-click **Add/Remove Programs**.
4. Click the tab named **Windows Setup**.
5. Double-click **Accessories**.
6. **Scroll down** till you see WordPad.
7. Click **WordPad** and make sure the check mark appears on the left.
8. Click **OK** to close the Accessories dialog box.
9. Click **OK** to close the Add/Remove Programs properties box.

Do not try to start any partitioned server unless you have added the TCPIP_TcpIpAddress statement. Also, make sure that the statement is typed correctly. If you make a mistake, the statement will be ignored and no error message will occur.

Start the Partitioned Server

Use the *Start Domino Server* (STRDOMSVR) command to start the new server. Completion message LNT0925 (as shown in Figure 36) will tell you the name of the subsystem that the server jobs are running in and which partition it will use.

```
    > strdomsvr acmeds1
      Starting Domino server acmeds1 in subsystem DOMINO03.
                                                                      Bottom
Type command, press Enter.
===> ____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
F3=Exit   F4=Prompt   F9=Retrieve   F10=Include detailed messages
 F11=Display full      F12=Cancel    F13=Information Assistant   F24=More keys
```

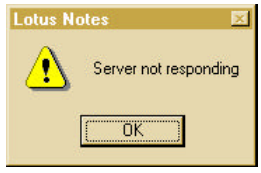
Figure 36. Starting Domino Server Completion Message LNT0925

You can use the *Work with Domino Servers* (WRKDOMSVR) command to find out which of the partitioned servers is running in which subsystem.

Verify the Server Is Listening to Only One IP Address

If you start a partitioned server without having added a TCPIP_TcpIpAddress statement, it will listen to port 1352 on *all* IP interfaces defined to the AS/400 system. This will "allocate" the port for each of the IP addresses to that server. If you subsequently start another partitioned server, it will not be able to open any TCP/IP communication. You will see the following error message:

Error on Listen function: The TCP/IP port used by the Notes server is still in use on this system.



The other server will be running (it will respond to console commands), but it does not have any access to

communication facilities. Trying to connect to the server from a Notes client will result in a "Server not responding" error message (as shown in the figure to the right).

Therefore, you have to end the server which has been started first and modify the NOTES.INI file before starting it again. Assuming you configured the second server correctly, it will automatically be able to open the interface 20 seconds after the first server has been ended.

In order to verify whether a server is listening to the correct IP interface, look at the status of the port named TCPIP using the Domino console command *show port*. To do so, use the *Work with Domino Console* (WRKDOMCSL) command from any AS/400 command line and then type the following Domino subcommand:

```
sh port tcpip
```

Press the **Enter** key followed by the **F5** key. You should get a response similar to the one shown in Figure 37.

Tip After starting the server, especially for the first time, it may take 5 minutes or more until the server responds to the *show port* command.

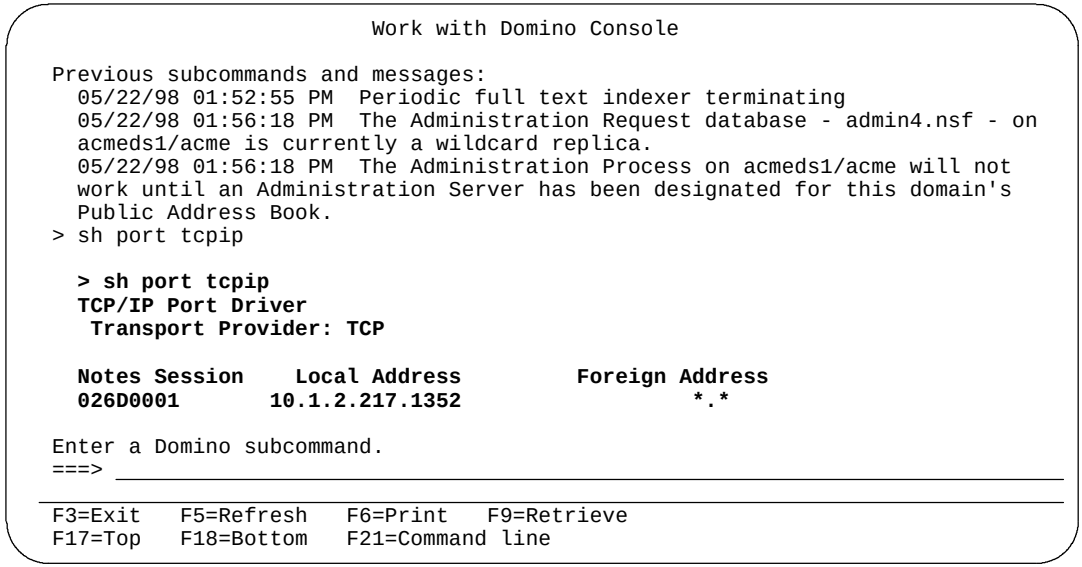

Work with Domino Console
Previous subcommands and messages:
05/22/98 01:52:55 PM Periodic full text indexer terminating
05/22/98 01:56:18 PM The Administration Request database - admin4.nsf - on acmeds1/acme is currently a wildcard replica.
05/22/98 01:56:18 PM The Administration Process on acmeds1/acme will not work until an Administration Server has been designated for this domain's Public Address Book.
> sh port tcpip
> sh port tcpip
TCP/IP Port Driver
Transport Provider: TCP
Notes Session Local Address Foreign Address
026D0001 10.1.2.217.1352 *.*
Enter a Domino subcommand.
===>
F3=Exit F5=Refresh F6=Print F9=Retrieve
F17=Top F18=Bottom F21=Command line

Figure 37. Show TCPIP Port Listening to Specific IP Address

If a user is already connected to the server at the time you use the *show port* command, you will see one or more additional lines showing a foreign address different than *.*. The line to look at, however, is the one showing *.* as a foreign address, which **must** show a specific address under a local address.

You should **not** see the following:

- The server is listening to *all interfaces* on the system
- The server is *not listening* to any interface

```
                        Work with Domino Console

Previous subcommands and messages:
 > sh port tcpip
  TCP/IP Port Driver
   Transport Provider: TCP

  Notes Session    Local Address          Foreign Address
  0CAC0001               *.1352                  *.*

Enter a Domino subcommand.
===>  ____________________________________________________________________

F3=Exit   F5=Refresh   F6=Print   F9=Retrieve
F17=Top   F18=Bottom   F21=Command line
```

Figure 38. TCPIP Port Listening to All IP Addresses

The Server Is Listening to All IP Interfaces

- As shown in Figure 38, the contents ***.1352** in column *Local Address* indicates that this server is listening to port 1352 on *all* IP addresses configured on the AS/400 system. While this does not cause any problem for this server, no other partitioned server will be able to connect to any TCP/IP port.

  The reason for this may be one of the following:

  - The NOTES.INI file has not been modified.
  - The NOTES.INI file has been modified, but the server has not been restarted since the modification.
  - The NOTES.INI file has been modified, but a typographic error has been made. For example, the following line is correct:

    TCPIP_TcpIpAddress=0,10.1.2.217:1352

  - Each of the following is incorrect[24]:

    TCPIP-TcpIpAddress=0,10.1.2.217:1352

    TCPIP_TcpIpAddress=1,10.1.2.217:1352

    TCPIP_TcpIpAddress=0,10.1.2.217;1352

    TCPIP_TcpIpAddress=0,10.1.2.117:1352

    TCPIP_TcpIPAdress=0,10.1.2.217:1352

[24] These are the mistakes:
- A dash (-) instead of an underscore (_) sign
- The first parameter after the equal sign must be 0 (zero)
- There must be a colon (:) between IP address and port
- Wrong IP address (according to our example)
- Spelling error in _TcpIPAddress (one d missing).

Note None of the mistakes shown above will cause an error message to be given when the server is started.

End this server, correct any errors in the NOTES.INI file and start the server again, before you start any other partitioned server.

The port TCPIP Is Not Listening to Any Interface

- In this case, the response to the show port tcpip command is two lines only:

  ```
  TCP/IP Port Driver
  Transport Provider: TCP
  ```

  This response indicates that the port named "TCPIP" was activated, but it failed while listening to an IP interface. By paging backwards in the Domino console, you may find additional error messages (shown in bold in Figure 39):

```
                        Work with Domino Console

Previous subcommands and messages:
> sh port tcpip
  05/22/98 02:34:45 PM  Error on Listen function: The TCP/IP port used by the
  Notes server is still in use on this system.
  05/22/98 02:34:45 PM  Error on Listen function: The TCP/IP port used by the
  Notes server is still in use on this system.
  05/22/98 02:34:45 PM  Error on Listen function: The TCP/IP port used by the
  Notes server is still in use on this system.
  05/22/98 02:34:45 PM  Listener task for port TCPIP is suspending for 20
  seconds due to listen errors

  > sh port tcpip
  TCP/IP Port Driver
   Transport Provider: TCP
Enter a Domino subcommand.
===>  ____________________________________________________________________________

F3=Exit    F5=Refresh    F6=Print    F9=Retrieve
F17=Top    F18=Bottom    F21=Command line
```

Figure 39. TCPIP Port Not Listening to Any IP Address

The most likely reason for this is that another partitioned server is already active and is listening to *all* interfaces on the AS/400 system, thus not allowing this server to use the same port.

However, you may find this error message:

Error on Listen function: The TCP/IP stack can't bind a network address to a TCP socket, please verify that the TCP stack has been properly initialized.

The message may be caused by one of the following reasons:

- TCP/IP support on your AS/400 system was not started.
- The IP interface was not started.

After verifying that the server is listening to only one specific IP address, repeat the same procedure for other partitioned servers on your AS/400 system.

All Servers Use the Same IP Address (Port Mapping)

Multiple partitioned servers on the AS/400 system can also use the same IP address - probably the only one configured on the AS/400 system. You can use TCP/IP port mapping to configure multiple partitioned servers to share the same line and the same IP address. TCP/IP port mapping requires you to assign a unique IP port number to each partitioned server that shares an IP address and assign one of these servers to be the port mapper server.

The port mapper server listens on the default Lotus Domino TCP port 1352 and directs connection requests to other servers that share the IP address. You must enter the unique port number of each partitioned server in the NOTES.INI file of the port mapper server. The port mapper server uses this information to redirect requests to the other servers that share its IP address.

The port mapper server must be running in order for the partitioned servers that share its IP address to receive new connections from workstations. If the port mapper server is down, new sessions cannot connect. Existing sessions, however, remain connected.

This is because each Notes workstation maintains information in memory about recent server connections, including those redirected by the port mapper. If this information is available, a workstation can reach a partitioned server even when its port mapper server is down.

You can use port mapping only for Notes and Domino communication. If you want to set up IMAP, LDAP, NNTP, POP3, or the Web server to use unique ports for communication, the user must specify the port on which they want to communicate. For example, if you specify port 12080 for the Web server as the default port to listen for HTTP requests, users must enter the port number as part of the URL (for example http://servername.domain.com:12080/index.html); otherwise Domino tries to connect using port 80. Unlike Notes and Domino communication, the Internet protocols do not have an automatic port mapper.

Additional Configuration to Support a TCP/IP Port Mapper

Using the port mapper approach, you have to declare one of the partitioned servers on your AS/400 system as the port mapper server. (See also “Configuring partitioned servers using unique TCP/IP port numbers” in the *Domino Administration Help* database (doc\helpadmn.nsf) or the *Extend the Domino System* book).

The port mapper server listens on the default Lotus Domino TCP port 1352 and directs connection requests to other servers that share the same IP address. All other servers on this system who listen to the same IP address have to use unique port numbers different from 1352. The port mapper “knows” (via a definition in its NOTES.INI file: the TCPIP_PortMapping0x= statement) which port each of the other servers is listening to and reroutes each session to the appropriate server.

That is, the port mapper NOTES.INI file needs to specify the IP address to be used for all servers, along with the standard port number 1352. For example:

```
TCPIP_TcpIpAddress=0,10.6.70.217:1352
```

In addition, you need to add in the port mapper's NOTES.INI file a "port mapping" statement for each of the other partitioned servers specifying their name and port numbers. For example:

```
TCPIP_PortMapping00=CN=AcmeDS3/O=OrgA,10.6.70.217:13520
TCPIP_PortMapping01=CN=AcmeDS4/O=OrgB,10.6.70.217:13521
TCPIP_PortMapping02=CN=AcmeDS5/O=OrgB,10.6.70.217:13527
```

The example specifies that AcmeDS3/OrgA will listen on port 13520 for IP address 10.6.70.217 and AcmeDS4/OrgB will listen on port 13521 of IP address 10.6.70.217.

Note The numbers 00, 01 and so on (after the word Mapping) do **not** relate to the partition numbers nor to the two digits appearing at the end of the subsystem names, and they must be in ascending sequence without any gaps.

The NOTES.INI file for each of the other servers just needs to specify its own IP address and port number. For example, for AcmeDS4/OrgB this would be:

```
TCPIP_TcpIpAddress=0,10.6.70.217:13521
```

Note that the port number (13521 in our example) could be any arbitrary number, provided that it is not used for other applications. When you specify the number, assign an available port number as specified in the *Assigned Numbers* RFC 1340[25]. A good approach is to use 5-digit numbers, so it is less likely the number is already used by other applications.

Assuming the server AcmeDS1 is the port mapper, for the servers AcmeDS3, AcmeDS4 and AcmeDS5, the NOTES.INI files for each server must contain the statements shown in the following sections.

---

[25] The contents of each RFC can be viewed from a Web browser. For example, the following Web sites describe RFC 1340:
http://info.internet.isi.edu/in-notes/rfc/files/rfc1340.txt or via the URL
http://www.rfc-editor.org/

Entries in NOTES.INI for Port Mapper AcmeDS1:

```
Edit File: /Notes/AcmeDS1/notes.ini
 Record . : ____54 of      86 by __9            Column: ___1 of   55 by _74
 Control  : ____________________________________________________________

CMD ....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+
___ BillingAddinOutput=1
___ MailClusterFailover=1
___ KillProcess=1
___ ServerName=AcmeDS1/acme
___ Ports=TCPIP
___ TCPIP=TCP, 0, 15, 0
___ TCPIP_TcpIpAddress=0,10.6.70.217:1352
___ TCPIP_PortMapping00=CN=AcmeDS3/O=OrgA,10.6.70.217:13520
___ TCPIP_PortMapping01=CN=AcmeDS4/O=OrgB,10.6.70.217:13521
___ TCPIP_PortMapping02=CN=AcmeDS5/O=OrgB,10.6.70.217:13522
___ $$HasLANPort=1
___ SPX=SPX, 0, 15, 0
___ Serial1=XPC,1,15,0,
___ Serial2=XPC,2,15,0,
___ DisabledPorts=SPX,Serial1,Serial2
___ LOG_REPLICATION=1

F2=Save F3=Save/Exit F10/11=Left/Right F12=Cancel F16=Find F17=Chg F15=Copy
```

Figure 40. Statements in NOTES.INI for the Port Mapper Server

The statements in the NOTES.INI file for the port mapper (AcmeDS1) not only need to define the file IP address (in line TCPIP_TcpIpAddress) along with the default port (1352). The addresses and unique port numbers for each of the other servers are also defined.

All other servers need to define only their own IP address (the same as for the port mapper) along with a unique port number as shown in the following figures.

Entries in NOTES.INI for AcmeDS3:

```
 ...
___ ServerName=AcmeDS3/OrgA
___ Ports=TCPIP
___ TCPIP=TCP, 0, 15, 0
___ TCPIP_TcpIpAddress=0,10.6.70.217:13520
___ $$HasLANPort=1
 ...
```

Figure 41. Statements in NOTES.INI for AcmeDs3 Server

Entries in NOTES.INI for AcmeDS4:

```
 ...
___ ServerName=AcmeDS4/OrgB
___ Ports=TCPIP
___ TCPIP=TCP, 0, 15, 0
___ TCPIP_TcpIpAddress=0,10.6.70.217:13521
___ $$HasLANPort=1
 ...
```

Figure 42. Statements in NOTES.INI for the AcmeDS4 Server

Entries in NOTES.INI for AcmeDS5:

```
 ...
___ ServerName=AcmeDS5/OrgB
___ Ports=TCPIP
___ TCPIP=TCP, 0, 15, 0
___ TCPIP_TcpIpAddress=0,10.6.70.217:13522
___ $$HasLANPort=1
 ...
```

Figure 43. Statements in NOTES.INI for the AcmeDS5 Server

Note The port mapper must be active, whenever a client tries to connect to one of the other partitioned servers.

Dedicate One Server as the Port Mapper

You can also dedicate a server as a port mapper server, so that it does not perform any functions other than routing clients to one of the other partitioned servers. In this case you can do the following:

- Remove all server tasks from the *ServerTasks* setting in the server NOTES.INI file.
- Remove large databases, such as the Help databases from the data directory. Do *not* remove the Public Address Book however, and make sure the address book is replicated with one of the other servers.

Connecting Partitioned Servers Through the Loopback Interface

Once you have configured multiple partitioned servers on the same AS/400 system, you may need to replicate your databases or allow mail routing between those servers. Since these servers reside on the same AS/400 system, it is obviously desirable to exchange information between them without the need for an external communication network.

Domino for AS/400 servers use TCP/IP for replication or mail routing. A network interface is used between stand-alone servers. In the default configuration, partition servers will use the external network interface for replication and mail routing. This section describes how to connect partitioned servers without a physical interface, using a special TCP/IP function called the loopback interface.

The loopback interface is a special virtual TCP/IP interface that allows socket connections without the use of a real hardware interface. The TCP/IP address of the loopback interface is 127.0.0.1. It is defined on every system, using TCP/IP as a networking protocol.

Assuming that you set up two or more partitioned servers as described in the previous sections, either with unique IP addresses or using a port mapper, you can do some additional configuration to allow those servers to connect via the loopback interface.

The following is what needs to be done:

- Modify the NOTES.INI file to define an additional Domino port[26] which allows a connection only to other partitioned servers on the same AS/400 system via the loopback interface. In our examples we call that port LOOPBACK.
- Since there is only a single loopback address, each server must listen to a different TCP/IP port. In our example, we use the port numbers 1353x, whereas x is a number between 0 and 9, thus providing a unique TCP/IP port number for each server.
- The new port (LOOPBACK) needs also to be defined and activated in the server document in the PAB.
- For each connection between any two servers, a pair of connection documents need to be added to the PAB.

In the following example we show what needs to be done to connect the partitioned servers AcmeDS1/acme and AcmeDS2/OrgA, assuming that both servers use unique IP addresses, that is, no port mapper is involved.

Add the following statements to the NOTES.INI file for AcmeDS1:

```
LOOPBACK=TCP, 1, 15, 0
Ports=TCPIP, LOOPBACK
LOOPBACK_TcpIPAddress=0,127.0.0.1:13530
```

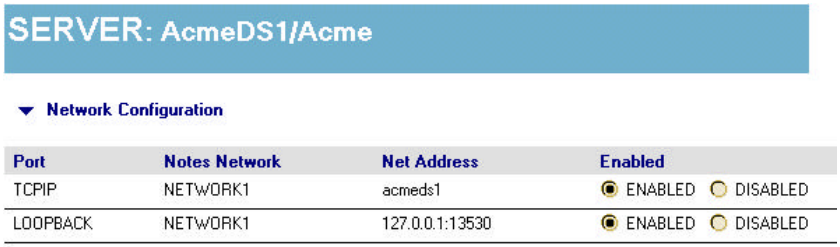
The first line defines a new Domino port called LOOPBACK. We then make sure that port will be activated, and finally this port is limited to IP address 127.0.0.1 (the “loopback”) listening the TCP/IP port 13530.

For the server AcmeDS2 NOTES.INI file, we do the same, except that we use a different TCP/IP port (13531):

```
LOOPBACK=TCP, 1, 15, 0
Ports=TCPIP, LOOPBACK
LOOPBACK_TcpIPAddress=0,127.0.0.1:13531
```

[26] The term “port” maybe misleading or confusing, because it is used for two different things in this context:
1. (In this sentence) This is a definition in Domino or Notes of how to connect to any of the supported networks — here: TCP/IP.
2. (Later in this paragraph) The TCP/IP port number provides a way for multiple applications on the same host system to share the same IP interface by distinguishing through the port number.

Next, after starting the servers, you need to modify the server document for each server.



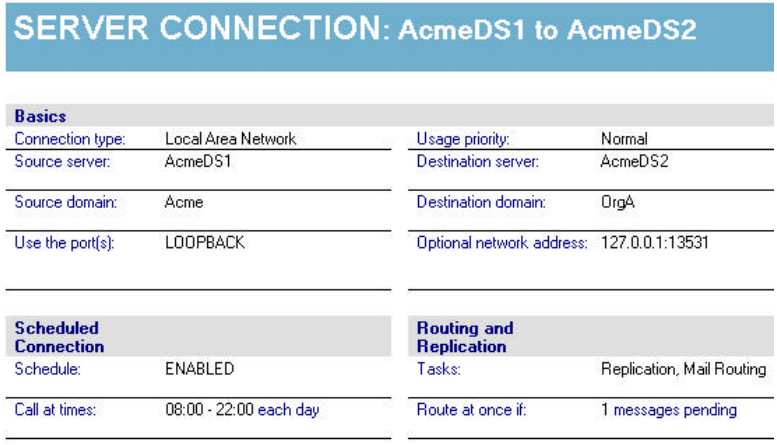
SERVER: AcmeDS1/Acme

Network Configuration

Port	Notes Network	Net Address	Enabled
TCPIP	NETWORK1	acmeds1	ENABLED DISABLED
LOOPBACK	NETWORK1	127.0.0.1:13530	ENABLED DISABLED

Figure 44. Server Document to Define Port for Loopback Interface

Since all the servers must be known in the network (via DNS or host tables) by their external IP addresses, you need to make sure that for a server-to-server connection the loopback interface is used. This can be done by adding a connection document to the Public Address Book. The following example defines the connection from server AcmeDS1 to AcmeDS2.



SERVER CONNECTION: AcmeDS1 to AcmeDS2

Basics			
Connection type:	Local Area Network	Usage priority:	Normal
Source server:	AcmeDS1	Destination server:	AcmeDS2
Source domain:	Acme	Destination domain:	OrgA
Use the port(s):	LOOPBACK	Optional network address:	127.0.0.1:13531

Scheduled Connection		Routing and Replication	
Schedule:	ENABLED	Tasks:	Replication, Mail Routing
Call at times:	08:00 - 22:00 each day	Route at once if:	1 messages pending

Figure 45. Connection Document to use Loopback Interface

Tip Make sure to enter the distinguished name (full hierarchical name) for both servers in the connection document. In our example that is AcmeDS1/Acme and AcmeDS2/OrgA, rather than AcmeDS1 and AcmeDS2. Also both server names should be part of the LocalDomainServers or OtherDomainServers group. Lotus suggests to define the servers group as "Access Control List Only." (rather than “Multi-Purpose”). Not following these suggestions may result in the servers not replicating and you will see the following error message in LOG.NSF:

`Access Control is Set in names.nsf to Not Allow Replication from AcmeDS1 names.nsf.`

It is likely that you will want each of the servers to be able to establish a connection. To do this you need a second connection document to define the direction from AcmeDS2 to AcmeDS1. If both servers were part of the same domain, you still need two connection documents; however, they would be in the same Public Address Book.

If the server is part of a different organization or different Domino domains, you also need to:

- Cross-certify their IDs
- Add an adjacent domain document on both servers
- Specify the other server mail domain as an adjacent mail domain name. This document makes it possible to route mail to the specified domain via the server connection document.

Configure an Additional Server in an Existing Domino Domain

If you already have one or more Domino (or Notes)[27] servers installed in your organization, you may want to add your Domino for AS/400 server to an existing Domino domain[28] and organization. This allows you to use the same organization certifier and use a replica of the existing Public Address Book.

Remember, a Domino *domain* is not only defined by using the same domain name; the correct definition is that all servers within a single domain use a replica of the same Public Address Book. So all the configuration can be done in one place and all users and servers are known to all servers within the domain.

The second important concept here is the *organization.* All Notes users and Domino servers within the same organization have an ID that is based on the same certifier, which was created (and stored in file cert.id) when the first server of the organization was set up. An organization can also be split into *organizational units.*

The default, and probably the most common way to structure a Notes network, is to use a single organization within a single domain. Note, however, that an organization can contain multiple domains, but it is also possible (but less likely) that multiple organizations or organizational units can be in the same domain.

For the purpose of this book, we have assumed that the domain contains the same set of users and servers as the organization. For more information, refer to the

[27] With Release 4.5 the product name for the server was changed from Lotus Notes to Lotus Domino. In this context it does not matter whether you have Notes servers 4.1 or older or Domino servers 4.5 or later. However, the name of the client product remains Lotus Notes.
[28] Note, the term Domino (or Notes) domain is absolutely not related to the TCP/IP domain.

Lotus Notes Release 4.5 Administrator's Guide, Part No. 127755, or the book *Getting Started with the Domino Server*, Part No. 12948.

Whenever we talk about configuring an *additional server*, we mean adding a new server to an existing Domino domain (that is, registering it to an existing Public Address Book) and at the same time including it in an existing organization (that is, creating its server.id based on an existing certifier). This is the main difference to a *first* server, where both the Public Address Book and the certifier ID are created.

When an additional server is installed, the server.id file is created when you register the new server to the existing Public Address Book, that is, *before* you configure the new server. No new administrator's ID is created. You either use the existing one to administer the existing and the new server or you create a new user ID if a different person needs to administer the new server.

The procedure to register a new Domino server is similar to registering a new Notes user.

Registering an Additional Domino Server

Before adding a Domino server to an existing Domino domain, you must register the server in the Public Address Book on a registration server. The registration server, that is, the Domino server from which you register other servers, must be up and running on your network. To register a new server from your workstation, you must have access to the registration server and have at least Author access to the Public Address Book with the appropriate role in the access control list of the Public Address Book.

From the Notes administrator workstation, perform the following steps:

1. Click:
   File - Tools - Server Administration...
2. Click the **Servers** button in the right pane of the administration panel.

3. Select **Register Server** from the pull-down menu as shown in Figure 46.

Figure 46. Register a Server Pull-Down Menu

4. Select the **Registration server**, where the new server will be created. If your registration server is not listed, you can type the name in.
5. Select the **Certifier ID** file of the organization. Your workstation needs access to the certifier ID and you need to know the correct password.

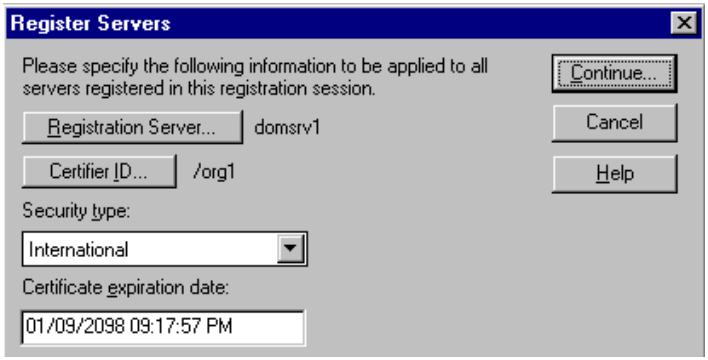


Figure 47. Register a New Domino Server

6. Click the **Continue** button.

In the Register Servers dialog box (Figure 48), type the required information:

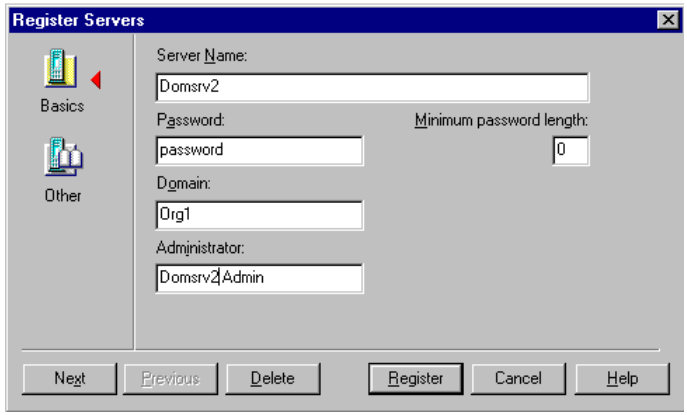


Figure 48. Register Servers Dialog Box

7. **Server Name:** Enter the name of the new server.

   For more information, see the *"Naming a Domino Server"* section earlier in this chapter.

8. **Password:** You can enter a password to protect server's ID file.

   The password is mandatory if you want the ID file to be attached to the server document in the address book (see step 14). Attaching the file to the server document seems to make the server configuration on the AS/400 system easier. However, after having successfully configured the server you either need to enter the password *manually*, every time you start the server in the future, or you clear the password (see "Clearing the Password of a Server ID File" on page 112).

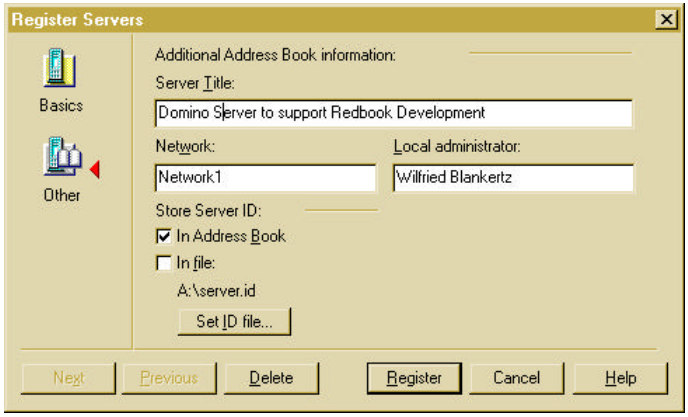
   Having said this, it becomes clear that the entire process is shorter if you do *not* specify a password (and consequently not attach the ID file to the address book). To do so, you also need to specify a minimum password length of zero (see step 11).

9. **Domain:** Enter the name of the existing Domino domain.

10. **Administrator:** Type the name of the local Notes administrator.
    This name must match the name of an existing Notes user, otherwise several administration functions cannot be performed for the new server. Note that when you configure an *additional* server on your AS/400 system, no administrator will be registered (as opposed to configuring a *first* server).

11. **Minimum password length:** Specify 0 (zero) to allow you to clear the password later. This also allows you to keep the password field in this panel empty, if you select *not* to attach the ID file to the address book (see step 14).

Click the **Other** icon. You will see the dialog box for the "Other" options for registering the new server as shown in Figure 49.



12. **Server Title:** This long title will be visible in the Public Address Book to identify the server.
13. **Network:** A Domino Named Network (DNN)[29] defines the network to be used by the Domino server.
14. **Store Server ID:** You have the choice of storing the new server ID as an attachment to the server document in the Public Address Book, or in a file on your workstation's disk drive, or both.

If you do not want to specify a password, deselect the check mark for "In Address Book".

The default disk for storing the ID file is the diskette drive A:. If you want to store the file on your hard drive, click **Set ID File ...**.

[29] Previously, that is with Domino Release 4.5 and earlier, DNN was called Notes Named Network (NNN).

Tip If your workstation does not have a diskette drive or it is empty, you will see error message "A:\ is not accessible" after clicking the **Set ID File ...** button. Click the **Cancel** button and you will be able to select the disk drive and the directory where you want to store the server.id file temporarily.

15. Click the **Register** button.

During the next couple of minutes, the actual registration process is performed by the registration server. This includes:

- Creating a server ID for the new server and certifying it with a certifier based on the existing organization (organizational unit) certifier, you selected in step 5 on page 108.
- Creating a Server document for the new server in the Public Address Book, and entering the administrator name in the Administrators field of the Server document.
- Encrypting and attaching the server ID to the Server document in the Public Address Book or saving the ID to a file on a disk of your workstation (or both), depending on the selection you made in step 14.
- Adding the server name to the LocalDomainServers group in the Public Address Book.
- Creating an entry for the new server in the Certification Log (`CERTLOG.NSF`), if you created one on the registration server.

After finishing this process, the new server is already known to the existing Domino domain and organization. However, it still needs to be configured (set up) on the AS/400 system using either the *Configure Domino Server* (CFGDOMSVR) command from a 5250 session or using the Operations Navigator. Before having a closer look at the setup parameters, we first discuss the two different ways to handle the new server ID file.

Handling the ID File for an Additional Server

As pointed out earlier (step 14 on page 110), there are two ways to create the new server ID when you register it:

- Attach the ID to the server document in the Public Address Book.
- Store the ID in a file without password on disk.

Each method has advantages and disadvantages. We describe the characteristics of each method in the following sections.

Attach the ID to the Server Document in the Public Address Book

The advantage of this method is that during the setup process on the AS/400 system (while performing the *Configure Domino Server* (CFGDOMSVR) command), the

ID file will automatically be retrieved from the registration server. The disadvantage is that a password must be specified for the ID file.

This is no problem during the configuration process, since you can specify the ID file password with the ADDSVRID parameter of the CFGDOMSVR command. However, when you start the server, after having configured it, it will not start unless you use the Domino console on the AS/400 system, using the *Work with Domino Console* (WRKDOMCSL) command and enter the correct password. This has to be done every time you start the server.

Clearing the Password of a Server ID File

Provided you did specify *minimum password length* = 0, in step 11 on page 109, you can clear the password at a later time. Following is the process to do so:

1. Copy the file server.id to a directory on the Administrator workstation. For more details, see "Using FTP to Copy the ID Files to the Administrator Workstation" on page 87 earlier in this chapter.

   - or -

   Map the Domino data directory on the AS/400 IFS as a network drive to your workstation.

2. From the Notes Client workstation click**:**
   File - Tools - Server Administration.
   The server administration panel appears.

3. From the menu bar, choose:
   Administration - Id file . . .

4. In the "Choose ID File to Examine" dialog box, select the server ID file from the directory where it was copied to (or which is mapped to your workstation) and click **Open**. The "User.ID" dialog box will appear.

5. Click **Clear Password**. . . . This will remove the password from the ID file. Remember, however, that this is only possible if you specified a minimum password length of zero when you registered the server.

6. If you did not use a network drive, use FTP to copy the ID file back to the AS/400 IFS.

   Important After having changed the ID file in the AS/400 IFS (no matter whether you copied it or used a network drive), the ownership for this IFS object has changed from user profile QNOTES to the user profile you were using when storing the modified file on the AS/400 system. Therefore, you must change the ownership back to QNOTES before you can start the server.

7. You can use the *Change Owner* (CHGOWN, *not* CHGOBJOWN) command to change ownership of an IFS object. Type the following command in any AS/400 command line and press the **Enter** key:

   ```
   chgown '/notes/data/server.id' qnotes
   ```

Note that the entire process described above has to be performed *after* you have configured the additional server on the AS/400 system as described in "Setting Up the Additional Server on the AS/400" on page 114. In contrast, if you choose not to attach the ID file to the address book, as described in the following section, you need to perform some steps *before* configuring the server.

Store the ID in a File on Disk Without Password Protection

If you do not attach the ID to the server document in the Public Address Book, you have the advantage that no password needs to be specified when registering the additional server. The disadvantage is that you need to copy the ID file from your workstation disk to the Domino data directory within the AS/400 IFS *before* configuring the server. This procedure is much shorter compared to the one described earlier with the ID file attached to the address book.

1. Before you can copy the new server ID file, you need to decide in which IFS directory you want to store the new ID file. It is a good idea to use the same directory as the data directory for the new Domino server. Normally the data directory is created when you execute the *Configure Domino Server* (CFGDOMSVR) command; in this case, however, you need to create the directory beforehand. Assuming you want to use `/notes/data` as you data directory, you can enter the following two commands on any AS/400 command line, to create that directory:

   ```
   md '/notes'

   md '/notes/data'
   ```

   Note that when you run the CFGDOMSVR command and the data directory already exists, its contents will not be deleted.

2. If you did not map a network drive, use FTP to copy the ID file back to the AS/400 IFS.

   Important After having changed the ID file in the AS/400 IFS (no matter whether you copied it or used a network drive), the ownership for this IFS object has changed from user profile QNOTES to the user profile you were using when storing the modified file on the AS/400 system. Therefore, you must change the ownership again before you can start the server.

3. You can use the *Change Owner* (CHGOWN - *not* CHGOBJOWN!) command to change ownership of an IFS object. Type the following command in any AS/400 command line and press the **Enter** key:

   ```
   chgown '/notes/data/server.id' qnotes
   ```

4. If you do not change ownership of the ID file and attempt to start the server, it will show the following message on the server console and will then terminate:

   ```
   Server exiting:
   The ID file is write protected
   ```

Now you can continue with the next task, which is to configure the additional server on your AS/400 system.

Verify Connection to NAB Server

During the setup process for an additional Domino server, the "Name and Address Book Server" (NAB server) will be contacted to request a replica of the Public Address Book. Therefore, the NAB server must be reachable by the AS/400 system via TCP/IP.

Note The term *Name and Address Book* (NAB) is no longer used for Domino. Starting with Notes 4.0 the NAMES.NSF database on a Domino server was renamed to *Public Address Book* (PAB). However, with Domino 5.0, the new name will be *Domino Directory*.

It is a good idea to verify the connection by performing a ping from an AS/400 command line. Note that a successful ping from your workstation to the NAB server does *not* guarantee that the AS/400 system can access that server too. You must enter *Verify TCP/IP Connection* (PING) command from an AS/400 command line (rather than from a DOS command line). For example, to verify the connection to the server called AcmeDS1, enter the following command on any AS/400 command line and press **Enter**:

```
ping acmeds1
```

You *must* be able to ping by name. If you cannot reach the server by specifying its name, but you do get a positive response by using the numerical IP address, the name along with the correct IP address needs to be added to a name server (if any exists) or to the AS/400 host table (using the *Configure TCP/IP* (CFGTCP) menu option **10** or the *Add TCP/IP Host Table Entry* (ADDTCPHTE) command).

Setting Up the Additional Server on the AS/400 System

The following steps describe the "green screen" method using the *Configure Domino Server* (CFGDOMSVR) command.

1. Sign on to the AS/400 with a user profile having at least the following special authorities:

***ALLOBJ**	Access to all AS/400 objects
***SECADM**	Security administrator
***JOBCTL**	Job control
***IOSYSCFG**	Device and communications configuration

2. On an AS/400 command line, type the *Configure Domino Server* (CFGDOMSVR) command and press **F4** to prompt the command. You will see the prompt as shown in Figure 50.

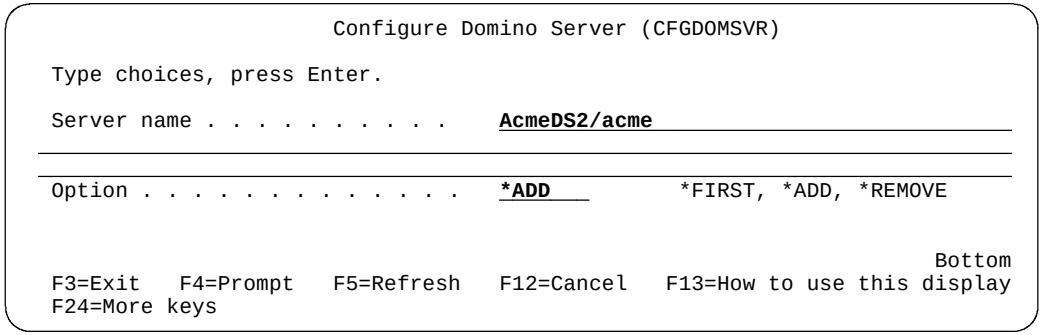

Configure Domino Server (CFGDOMSVR)
Type choices, press Enter.
Server name AcmeDS2/acme
Option . . . . . *ADD *FIRST, *ADD, *REMOVE
Bottom
F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display
F24=More keys

Figure 50. CFGDOMSVR for Additional Server - 1. Prompt

Detailed Description of Parameters for an "Additional" Server

The following section guides you through all the parameters which can, or must, be specified when you set up (configure) a server which is an additional server in an existing Domino domain.

1. Fill in the following parameters in the prompt shown in Figure 50:

Keyword	*Description*
SERVER	**Server Name** The name of your new Domino server. When you configure an additional server, you must type the full name, that is, the *hierarchical* name of the server. Example: AcmeDS2/acme
OPTION	**Option** Specifies whether you are setting up the first Domino server in a Notes domain (*FIRST), adding an additional Domino server to an existing Domino domain, or removing a Domino server from your AS/400. Example: *ADD

2. Press **Enter** and fill in the following additional parameters presented.

Note The contents of parameter OPTION controls which additional parameters will be prompted after you press the **Enter** key. For this example, we chose *ADD, so that the new server will be added to an existing domain.

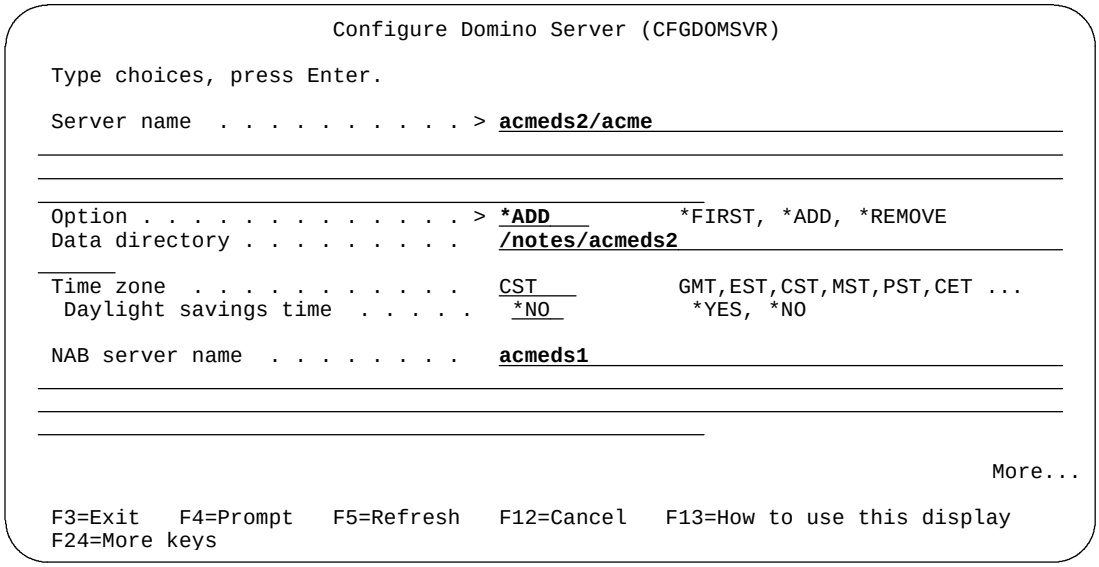

Configure Domino Server (CFGDOMSVR)
Type choices, press Enter.
Server name . . . . . > acmeds2/acme
Option . . . . . > *ADD *FIRST, *ADD, *REMOVE
Data directory . . . . . /notes/acmeds2
Time zone . . . . . CST GMT,EST,CST,MST,PST,CET ...
Daylight savings time . . . . . *NO *YES, *NO
NAB server name acmeds1
More...
F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display
F24=More keys

Figure 51. CFGDOMSVR for Additional Server - 2. Prompt

Keyword	*Description*
DTADIR	**Data Directory** Specifies the path to the integrated file system directory where you want Domino data files to reside. If the specified directory does not exist, it is automatically created. Note that you cannot specify any drive letter (such as C:) here, as you would on other platforms. The hierarchy of directories is indicated by *slashes* (/), not by backslashes (\). Example: /notes/acmeds2
TIMEZONE	**Time zone** Specifies the time zone to be used by the Domino server.
DAYSAVTIME	**Daylight savings time** Specifies whether the server time stamp should be adjusted for daylight savings time (DST). Default: *YES
	continued
NABSVR	**NAB server name** Specifies the name of an existing Domino server that has the Public Address Book to be used for this server. The Name and Address Book (NAB) is copied from the specified Domino server to this new server. Because the Public Address Book has a large amount of information, the copy time could be extensive. The name of the NAB server must *not* be specified in the hierarchical form. It must be the valid IP host name for that server. You *must* specify a server name when you specify an Option of *ADD.

3. Press the **PgDn** key to see the next set of parameters.

```
                    Configure Domino Server (CFGDOMSVR)

Type choices, press Enter.

Additional server ID:
   ID file  . . . . . .  /notes/acmeds2/server.id
_____
   ID file's password . . . . . .
Log replication events . . . . .  *YES          *YES, *NO
Log client session events  . . .  *YES          *YES, *NO
Replace configuration  . . . . .  *YES          *YES, *NO
Web browsers . . . . . .  *NONE          *NONE, *HTTP
News readers . . . . . .  *NONE          *NONE, *NNTP
Internet mail packages . . . . .  *NONE___      *NONE, *ALL, *IMAP, *LDAP...
              + for more values   ________
Advanced services  . . . . . .  *NONE_____    *NONE, *ALL, *PARTITION...
              + for more values   __________


                                                                      Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 52. CFGDOMSVR for Additional Server - 3. Prompt

Keyword	*Description*
ADSVRID	**Additional Server ID** **ID file:** ***NAB** specifies the server ID file is retrieved from the Name and Address Book for the Domino domain in which the new server was registered. Otherwise specify the path name that identifies the server ID file to be used for the new server. Example: /notes/data/server.id Default: *NAB **ID file password** For the ID file's password, specify the password that is associated with the new server when it is created. A password is required only if the new server ID file is password-protected. Remember, if the ID file is attached to the server document in the Public Address Book, it must be password-protected.
LOGREPEVT	**Log replication events** Specifies whether the replication events should be logged in the Notes log (LOG.NSF) for this Domino server. Default: *YES
LOGSSNEVT	**Log client session events** Specifies whether the client session events should be logged in the Notes log (LOG.NSF) for this Domino server. Default: *YES
RPLCFG	**Replace configuration** Specifies whether the existing Domino server configuration files in the directory that is specified in the Data directory (DTADIR) parameter should be erased and replaced with the new ones. These files are NOTES.INI, NAMES.NSF, and the ID files in the data directory. Default: *YES
WEB	**Web browsers** Specifies whether a Web server feature should be included in the Domino server configuration. The Web server feature automatically starts the Domino HTTP server and enables Web browsers to access the Domino server. Example: *HTTP Default: *NONE
NEWS	**News readers** Specifies whether an Internet news reader should be included in the Domino server configuration. A news reader enables the Domino server to send messages to and receive messages from Internet news groups. It also enables Internet news readers to access the Domino server. Example: *NNTP Default: *NONE

Keyword	*Description*
MAIL	**Internet mail packages** Specifies which, if any, Internet mail packages should be included in the Domino server configuration. The mail packages enable the Domino server to send mail to and receive mail from the Internet. Unless *ALL or *NONE is entered, one or more keywords can be entered. Possible Values: *ALL *IMAP *LDAP *POP3 *SMTPMTA Default: *NONE
ADVSRV	**Advanced services** Specifies which, if any, features of the Lotus Domino Advanced Services should be included in the Domino server configuration. Unless *ALL or *NONE is entered, one or more keywords can be entered. If you plan to use clustering or billing for this server, you need to select the appropriate key word. If you plan to configure multiple logical (*partitioned)* servers, you need to select *PARTITION for *all* servers, even if you only configure one at this time. Possible Values: *ALL *PARTITION *BILLING *CLUSTER Default: *NONE

Start the Configuration Process

4. Press **Enter** to start the configuration process. Your keyboard will be locked and the display will not change for approximately the next 3 to 5 minutes. Unlike setting up a first server, you will *not* see the *Terminal Session Display* (Figure 14 on page 69) unless errors occur.

Platform Independent Phase of Server Setup

During this phase, many Notes databases (.NSF files), Notes templates (.NTF files) and other files needed for this server are placed in the data directory.

Since you are setting up an additional server, ID files and the Public Address Book will **not** be newly created. Instead, the "NAB server" (registration server) will be contacted via TCP/IP and the following happens at the registration server, depending on whether the ID was attached to the new server document (*NAB) or stored as a file in an IFS directory:

ID File Attached to Server Document (ADSRVID = *NAB):

- The server documents in the Public Address Book are searched for the name specified with the SERVER parameter using the full hierarchical name.
- The password provided in the second part of the same parameter is used to open the ID file attached to the server document.
- A replica of the existing Public Address Book is created in the data directory of the new server.

- The ID file is detached from the server document and stored in new server data directory.

ID File Stored in IFS Directory:

- The ID file specified with parameter ADSRVID will be opened by Domino if necessary using the password provided in the second part of the same parameter.
- The server documents in the Public Address Book are searched for the name stored within the ID file.

Caution There will be no error message if the name specified with the SERVER parameter and the one stored in the ID file do not match.

- A replica of the existing Public Address Book is created in the data directory of the new server.

A completion message will indicate the successful configuration of your Domino server.

AS/400 Related Part of Server Setup

After 5 to 15 minutes (depending on size and workload of your AS/400 system), the end of this configuration phase is indicated by the message *Press ENTER to end terminal session*.

5. Press **Enter** and the very short final phase of the configuration will be performed. At this time, the AS/400 specific part of the configuration will be performed. That is, a subsystem name of the form DOMINOxx will be associated with the additional server and the subsystem description (an object of type *SBSD) will be created in library QUSRNOTES.

Reconfiguring the Domino Server

After you set up a Domino server on the AS/400 system, you may find it necessary to change a particular characteristic of the server. For example, you may need to change from a non-partitioned server to a partitioned server or you may want to add other capabilities such as billing or the SMTP MTA.

You can reconfigure the Domino server by using the same procedure you used originally to set up the server. When you reconfigure the server, use the same values, except:

- Specify the exact location of the existing Certifier ID, administrator ID, and server ID files for the server. Specifying the location of the ID files avoids creating new ID files.
- Specify *NO in the Replace configuration field.
- Specify any values you want to add or change. The main change in our example is to select *PARTITION rather than *NONE for *Advanced Services.*

For example, to reconfigure the first Domino server we set up earlier in this book as a partitioned server, run the *Configure Domino Server* (CFGDOMSVR) command again and specify the parameters as shown in Figures 53 through 55.

```
                    Configure Domino Server (CFGDOMSVR)

Type choices, press Enter.

Server name  . . . . . . . . . . > acmeds1
Option . . . . . . . . . . . . . > *FIRST       *FIRST, *ADD, *REMOVE
Data directory . . . . . . . . .   /notes/data
Organization . . . . . . . . . .   Acme
Administrator:
  Last name  . . . . . . . . . . > Blankertz
  First name . . . . . . . . . . > Wilfried
  Middle initial . . . . . . . .   __            Character value
  Password . . . . . . . . . . .   xxxxxxxx
  Minimum password length  . . .   8             0-31
                                                                More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 53. Reconfigure First Server - 2. Prompt

Caution Make sure to make backup copies of your critical Domino files, such as your ID files, Public Address Book, and Domino databases, before you begin the reconfiguration process.

There is one difference between Notes on an Integrated PC Server (IPCS) and Domino for AS/400: When you configure a Domino server on IPCS, if the Public Address Book (PAB) exists, the configuration process deletes the PAB and creates a new one. Domino for AS/400, as well as Lotus Notes and Domino on other platforms, will use the existing one.

```
                    Configure Domino Server (CFGDOMSVR)

 Type choices, press Enter.

 Time zone  . . . . . .  ___              GMT,EST,CST,MST,PST,CET ...
 Daylight savings time  . . . . .  *YES   *YES, *NO
 Domain name  . . . . . .  *ORG
 Network name . . . . . .  NETWORK1
 Country ID . . . . . .  *BLANK
 Log replication events . . . . .  *YES  *YES, *NO
 Log client session events  . . .  *YES  *YES, *NO
 Replace configuration  . . . . .  *NO   *YES, *NO
 Web browsers . . . . . .  *NONE         *NONE, *HTTP
 News readers . . . . . .  *NONE         *NONE, *NNTP
 Internet mail packages . . . . .  *NONE    *NONE, *ALL, *IMAP, *LDAP...
               + for more values
 Advanced services  . . . . . > *PARTITION   *NONE, *ALL, *PARTITION...

 Certifier ID . . . . . .  /notes/data/cert.id
______
                                                                    More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

Figure 54. Reconfigure First Server - 3. Prompt

When you reconfigure a Domino server and specify RPLCFG(*NO), if all the ID files are provided and the PAB already exists, then the information in the PAB and ID files will not be changed. This means that the Administrator's names, time zone and similar information in PAB and IDs remain the same as before. However, you do need to enter the administrator's password to authenticate the cert.id and user.id during reconfiguration.

```
                    Configure Domino Server (CFGDOMSVR)

 Type choices, press Enter.

 Administrator ID . . . . . .  /notes/data/user.id
____
 Server ID  . . . . . .  /notes/data/server.id
____


                                                                    Bottom
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

Figure 55. Reconfigure First Server - 4. Prompt

Installing a New Version of Lotus Domino for AS/400

Before installing a new release of Domino for AS/400 make sure to read the *Lotus Domino for AS/400 Release Notes.* A printed version is provided with the CD

ROM. You may also refer to the online version on the CD ROM in form of a Domino database called `readme.nsf`. It is also a good idea to verify the if your CD contains the latest available version by consulting the Web at the following URL:

`Http://notes.net/notesua.nsf/`

Click on “What's New?” and then on “Lotus Domino for AS/400 4.6.2 Release Notes”.

To update your installed Domino for AS/400 software to release 4.6.2, do the following:

1. Use the Display Software Resources (DSPSFWRSC) command to determine which Domino for AS/400 options you have installed. On the display, locate 5769LNT. The display shows one or more lines for each option of Domino for AS/400 that is installed on your system. (The option numbers appear in the Option column.) Write down each option number for Domino for AS/400 that appears on the display.
2. Ensure that you have current backup copies of all the Domino servers on the AS/400 system where you plan to install the new release. Back up both the Domino data directories and all the Domino libraries. For information about backing up your Domino for AS/400 servers, see Chapter 5 in Installing and Managing Domino for AS/400.
3. End all Domino servers on the AS/400 system. Use the End Domino Server (ENDDOMSVR) command or Operations Navigator to end the servers.
4. If you use directory synchronization, end the directory synchronization jobs. Type the following:

   ```
   call qnotesint/qnndiend
   ```

5. After allowing at least 5 minutes for the servers and directory synchronization to end, use the Work with Active Jobs (WRKACTJOB) command to verify that no DOMINOnn subsystems are active. Also, check the QSYSWRK subsystem to ensure that no jobs starting with "qnndi" are running.
6. Load the CD for Domino for AS/400 4.6.2 in the CD-ROM reader on the AS/400 system unit.
7. Type the following command:

   ```
   lodrun dev(*opt) dir('/os400/')
   ```

8. If the CD contains more than one language version, you must select a language on the prompt display. Type a **1** next to the language version that you want to install.
9. On the prompt display, type a **1** next to each product option that you want to install. You must select each option that you already have installed on your

system. (You determined this in step 1.) You may also choose to install additional options.

10. Press **Enter**. The system loads the updated Domino for AS/400 programs to the appropriate libraries and /QIBM directories. You see status messages as the system installs each option that you selected.

In addition, the system copies updated data files to the data directory for each Domino server on the AS/400 system. The system requires approximately 3 minutes for this update process per Domino server. During this process, you see a status message like the one shown at the bottom of Figure 56 for each server that the system upgrades.

```
          Install Lotus Domino For AS/400 Licensed Program (5769LNT)

Type options, press Enter.
 1=Install

           Product    Installed
Option     Option     Status          Description

  1        *BASE      *INSTALLED      Domino 4.6 Server
  1        1          *INSTALLED      AS/400 Integration
  1        3          *INSTALLED      C API Release 4.5
  1        4          *INSTALLED      C++ API Release 4.1
  1        5          *INSTALLED      LotusScript Extension Toolkit
  1        6          *INSTALLED      HiTest C API Release 4.5
  1        7          *INSTALLED      Advanced Services



F3=Exit      ENTER To Continue

(C) COPYRIGHT IBM CORP. 1980, 1998.
(C) COPYRIGHT LOTUS DEVELOPMENT CORP. 1998.
Upgrading AcmeDS3 ...
```

Figure 56 . Install a New Version of Lotus Domino for AS/400

11. When the installation process completes, you receive a message indicating whether the *Load and* Run (LODRUN) process completed successfully or encountered errors.

Batch Installation of Lotus Domino for AS/400

Beginning with release 4.6.2, you have the option to install Domino for AS/400 without responding to the prompt display that requires you to select which options to install. This is particularly useful for multiple installations in remote locations that do not have skilled administrators or that require unattended installation during off-hours. Two methods for batch installation are available:

- Local batch, where the installation command is submitted on the same system where the software is to be installed.
- Remote batch, where the installation command is sent to a remote system where the software is to be installed.

Local batch installation

To install all the options for Domino for AS/400, place the Domino for AS/400 CD in the CD-ROM device of your AS/400 system. Type the following command or include the following command in a CL program:

```
lodrun dev(*opt) dir('/os400/intleng/batch')
```

Note `INTLENG` is the directory on the CD that contains international English. If desired, replace `INTLENG` with the name of the directory that contains the language you want to install.

To install only certain options, specify the subdirectory that contains the option you want to install. You need to run the LODRUN command once for each option that you want to install. For example, to install the *BASE option (option 00), option 1, option 4, and option 6, type the following commands or run them from a CL program:

```
lodrun dev(*opt) dir('/os400/intleng/batch/opt00')
lodrun dev(*opt) dir('/os400/intleng/batch/opt01')
lodrun dev(*opt) dir('/os400/intleng/batch/opt04')
lodrun dev(*opt) dir('/os400/intleng/batch/opt06')
```

Remote batch installation without remote CD

To install Domino for AS/400 at remote locations without requiring the CD at the remote location, do the following:

1. Install Domino for AS/400 on the central system.
2. To create a library for the save files that will contain the Domino software, use the *Create Library* (CRTLIB) command. Substitute the name of your library for `MYLIB`.

   ```
   CRTLIB LIB(mylib)
   ```

3. To create a save file to hold the Domino software, us the Create Save File (CRTSAVF) command. Substitute the name of your save file for `dominob`.

   ```
   CRTSAVF FILE(mylib/dominob)
   ```

   Note You need a separate save file for each Domino option that you want to save. For example, create save file dominob for the base software. For example, create save file `DOMINO3` for Domino for AS/400 option 3.

4. To save the base Domino for AS/400 software to the save file, use the *Save Licensed Program* (SAVLICPGM) command. Substitute your library name and save file name for `MYLIB` and DOMINOB.

```
SAVLICPGM LICPGM(5769LNT) DEV(*SAVF) SAVF(mylib/dominob)
```

5. For each additional software option that you want to save, use the SAVLICPGM command and a new save file. For example, to save option 3, use the following command:

```
SAVLICPGM LICPGM(5769LNT) option(3) DEV(*SAVF)
            SAVF(mylib/domino3)
```

6. Use the Send Network File (SNDNETF) command or FTP to move a copy of the save files to the remote system where you want to install Domino for AS/400.

7. On the remote system, use the Restore Licensed Program (RSTLICPGM) command to install Domino for AS/400 from the save files. You need to install each Domino option separately. For example, to install the base software, type:

```
rstlicpgm licpgm(5769LNT) dev(*savf) savf(mylib/dominob)
```

8. If necessary, use the Change User Profile (CHGUSRPRF) command to set the locale for the QNOTES user profile:

```
chgusrprf usrprf(qnotes) locale(newlocale)
```

Note For information about setting the locale parameter, see "National Language Considerations" on page 55.

Removing a Domino for AS/400 Server

Unlike the Domino implementation on some other platforms, you do not have to delete the entire Lotus Domino for AS/400 software if you just want to remove the server instance. Use the *Configure Domino Server* (CFGDOMSVR) command to delete a Domino server from your AS/400 system.

Caution Deleting a Domino server also deletes the data directory for the server. The data directory contains server files such as the Public Address Book and all Notes databases created by users.

Before removing a server, you should make sure that you end the server in an orderly manner, otherwise locks on one or more Notes databases may prevent the data directory from being deleted. Also, if you enabled directory synchronization for that server, make sure that you disable it before you end the server.

To remove the server called AcmeDS1 from your AS/400 system, type the following command on any AS/400 command line and press **Enter**:

```
CFGDOMSVR acmeds1 *REMOVE
```

Note Removing a server does not remove the Domino for AS/400 product from your system.

If you need to make sure that the complete data directory has been deleted, you can use the *Work with Object Links* (WRKLNK) command to verify whether the directory still exists. For example, enter the following command on any AS/400 command line:

```
WRKLNK '/notes/data'
```

Depending on how the server was ended before removing it, some or all of the files and directories within the data directory may still exists and must be deleted manually.

Deleting the Domino Software from the AS/400 System

Note Unlike the Domino implementation on some other platforms, you do not have to delete the entire Lotus Domino for AS/400 software if you just want to remove the server instance. Use the *Configure Domino Server* (CFGDOMSVR) command to delete a Domino server from your AS/400 system.

Use the *Delete Licensed Program* (DLTLICPGM) command to delete Domino software from your AS/400 system. You must have *all objects* (*ALLOBJ) special authority to use this command.

Before deleting the software, make sure that you disable directory synchronization and end all servers. After doing so, you should verify that no job under user profile QNOTES is active or in the job queue. You can check for the latter by entering the following two commands on any AS/400 commands line:

```
WRKUSRJOB QNOTES STATUS(*ACTIVE)
WRKUSRJOB QNOTES STATUS(*JOBQ)
```

If you still see one or more jobs active make sure that all servers have been ended completely. This may take several minutes. If a server does not end within 10 minutes after performing the *End Domino Server* (ENDDOMSVR) command, end the server with OPTION(*IMMED).

Jobs with names starting with the QNNDI are part of directory synchronization, which may continue running after the server has ended. To end those jobs, enter the following command on any AS/400 command line:

```
CALL QNOTESINT/QNNDIEND
```

After making sure that all jobs under QNOTES are ended, you can delete the code. On any AS/400 command line, type the following command and press the **Enter** key:

```
DLTLICPGM 5769LNT
```

The command shown above deletes the base and all options of the product. If you want to delete a single option, for example, the C APIs, specify option **3** only as shown in the following example:

```
DLTLICPGM 5769LNT OPTION(3)
```

Note that servers and data directories are not removed when you delete the software. If you want to delete everything, you have to use the *Configure Domino Server* (CFGDOMSVR) command with option *REMOVE before deleting the software (see "Removing a Domino for AS/400 Server" on page 127).

Miscellaneous Tips and Techniques

The following sections contain various topics related to using Lotus Domino for AS/400.

Environment Variables

Environment variables are important for setting the Domino environment just like on other platforms. Two commands are used to manipulate environment variables.

- *Work with Environment Variables* (WRKENVVAR) allows you to see the list of current environment variables and their values. It also allows you to add or change an environment variable.
- *Add Environment Variables* (ADDENVVAR) allows you to add a environment variable.

On the AS/400 system the environment variable is set as long as a job is active. For interactive jobs it is active until you sign off the job. The AS/400 system does not have an `autoexec.bat` or `.login` file that is used every time a new job is set.

The way to do this on the AS/400 is a two step process. Whenever you start a Lotus Domino for AS/400 server, the environment variables being defined for your job at the time when you perform the *Start Domino Server* (STRDOMSVR), are used by Domino to change default settings for the server. For example if you want to change the size of the Domino console, you can do the following:

1. Add an environment variable for your job, by entering the following command on any AS/400 command line:

   ```
   ADDENVVAR ENVVAR('NOTES_AS400_CONSOLE_ENTRIES')
             VALUE('100000')
   ```

   If the variable already exists, you would change it:

   ```
   CHGENVVAR ENVVAR('NOTES_AS400_CONSOLE_ENTRIES')
             VALUE('100000')
   ```

2. Now you can start the server by either entering option 1 in the *Work with Domino* Servers (WRKDOMSVR) display or by using the *Start Domino Server* (STRDOMSVR) command.

Changing the Size of the Domino Console

With the AS/400 implementation of the Domino console support is a limit to the number of console entries allowed in the file. The default limit is 2000 entries and the maximum is 100,000 entries. When the limit is reached, the console file will start to wrap. The WRKDOMCSL/DSPDOMCSL support will handle this wrapping, but there are times when 2000 entries is not enough. An environment variable is used to increase the amount of entries in the console file. The variable is NOTES_AS400_CONSOLE_ENTRIES. This variable must be set prior to starting the server. If the value of the variable is greater that the maximum then it is set to the maximum value.

Running Domino Tasks While the Server is Not Running

Many times it is useful to run a task while the server is not running. For example, you may want to fixup or compact the Domino directory without having the server up. Domino on the AS/400 is integrated with the AS/400 security system. Therefore, there are some unique requirements for running a Domino task outside the server (that is not through the load command in the Domino console). Essentially there are three requirements:

- The correct environment variables must be set. The two environment variables that need to be set are the PATH and NOTESPARTITION environment variables.
- The job must run under the QNOTES user profile.
- The current IFS directory must be the appropriate data directory.

The following commands can be entered on the command line and they will enable a Domino administrator to have a Domino task run without the server up and running. This particular set of instructions will run the FIXUP task against the names.nsf file of the server for the subsystem DOMINO01 and has the data directory at /notes/data.

```
ADDENVVAR ENVVAR(PATH)
        VALUE('/QIBM/PRODDATA/LOTUS/NOTES:/QIBM/USERDATA/LOTUS/NOTES:/notes/data')

ADDENVVAR ENVVAR(NOTESPARTITION) VALUE('01')

CHGCURDIR DIR('/notes/data')

SBMJOB CMD(CALL PGM(QNOTES/FIXUP) PARM('names.nsf') USER(QNOTES) CURLIB(*USRPRF)
         INLLIBL(*NONE) CPYENVVAR(*YES)
```

Tips for Problem Determination

Problem determination is an unfortunate, but, inevitable part of every Domino administrator's job. With Domino for AS/400, you will be familiar with some of the problem determination techniques that are the same as other Domino platforms. Other techniques are unique to the AS/400.

The Notes Server Dump Tool

First the more common problem determination techniques. Domino for AS/400 does have the Domino console and supports all of the Domino console commands that are useful in problem determination (ie. show task, show statistic, etc...). Also, Domino for AS/400 supports the Notes Server Dump (NSD) tool.

NSD is supported on many of the Unix platforms and provides information when a problem occurs. When a panic occurs, the NSD tool will write to the server's data directory all the pertinent information that it has prior to ending. This information includes call stacks and a copy of the current state of the console entries. The name of the file is of the format `nsd_all_os400_19980211_13:06:46`, where `19980211` is the date of the dump and 13:06:46 is the time of the dump. This dump file can be viewed with either the *Display Stream File* (DSPSTMF) or the *Edit File* (EDTF) commands.

Domino Server Job Logs

Now onto some problem determination techniques that are unique to the AS/400. The first is job logs. In the previous section we touched on how to view job logs of running jobs. Job logs contain AS/400 messages that indicate if something has gone seriously wrong. Each message in the job log has a severity associated with it. If the severity is above 40 then the job has terminated. When a job has terminated because of an error, the job log is saved on a spool file based on userid. For the Domino servers, all spool files will be found under userid QNOTES. The command *Work with Spool Files* (WRKSPLF) will let you look at spooled job logs. Enter the following from the command entry line to see the job logs of all the Domino servers:

```
WRKSPLF QNOTES
```

Important It is best to look at the spool files while in *intermediate assistance level*. However, the default on an AS/400 system is basic assistance level (unless otherwise specified in your AS/400 user profile). If you basic assistance level, the WRKSPLF command will not show any job logs (or other system output, like dumps). To get to intermediate assistance level, enter the WRKSPLF command and when it displays the list of spool files press **F21** (shift **F9**) and then select assistance level **2**.

An example of the output from the WRKSPLF command is in Figure 57.

```
                          Work with All Spooled Files

Type options, press Enter.
  1=Send   2=Change   3=Hold   4=Delete   5=Display   6=Release   7=Messages
  8=Attributes        9=Work with printing status

                               Device or                          Total     Cur
Opt  File         User         Queue        User Data    Sts      Pages     Page  Copy
 _   QPJOBLOG     QNOTES       QEZJOBLOG    DRT          RDY          1             1
 _   QPJOBLOG     QNOTES       QEZJOBLOG    OMSGCNV      RDY          1             1
 _   QPJOBLOG     QNOTES       QEZJOBLOG    IMSGCNV      RDY          1             1
 _   QPJOBLOG     QNOTES       QEZJOBLOG    OSESCTL      RDY          1             1
 _   QPJOBLOG     QNOTES       QEZJOBLOG    ISESCTL      RDY          1             1
 _   QPJOBLOG     QNOTES       QEZJOBLOG    SMTPMTA      RDY          1             1
 _   QPJOBLOG     QNOTES       QEZJOBLOG    EVENT        RDY          1             1
 _   QPJOBLOG     QNOTES       QEZJOBLOG    REPLICA      RDY          1             1
 _   QPJOBLOG     QNOTES       QEZJOBLOG    ADMINP       RDY          1             1
 _   QPJOBLOG     QNOTES       QEZJOBLOG    UPDATE       RDY          1             1
                                                                                More...
Parameters for options 1, 2, 3 or command
===> ____________________________________________________________________________
F3=Exit   F10=View 3   F11=View 2   F12=Cancel   F22=Printers   F24=More keys
```

Figure 57. Work with Spooled Files of QNOTES

Note in Figure 57 that the User Data column is the name of the Domino tasks. As a general rule, when in problem determination, look at the job logs that are more than one page. When you press **F11**, you will see the data and time when the job log was spooled (in other words when the job was ended), this may help you identifying the failing job, if there are many job logs on your system.

Note You will find the job log as spooled file only if the related AS/400 job already ended. If the job is still active, you have to use option **10** of the *Work with Job* display, as describe in the following section “Discovering Server Restarts”.

Note By default, job logs and other system out put written to the output queue QEZJOBLOG, are not automatically printed. However, this may be changed by customers, in such a case you will not be able to display the spooled file. If not printed, spooled files containing job logs are deleted after 7 days by the automatic cleanup procedure, unless the time interval was changed by the customer using the *Change Cleanup* (CHGCLNUP) command.

Discovering Server Restarts

Another unique feature in Domino for AS/400 is the auto-restart capability. This feature consist of listening for errors to occur in your Domino server. If an error occurs then the server will gracefully turn itself off, clean-up all of it's storage and internal structures and then re-start itself. There are some cases where the restart will fail, but these are infrequent.

Sometimes it is difficult to know if the server has restarted itself. One way to find out is to look at the job log of the QNNINSTS job. Using *Work with Active Jobs* (WRKACTJOB), go to the subsystem for the Domino server that you want to look at, or - the easiser way - use option 9 of the new *Work with Domino Servers* (WRKDOMSVR) command. Page down until you find the job QNNINSTS for that subsystem (every Domino server partition that is running will have it's own QNNINSTS job running in it). Look at the job log for the QNNINSTS job (option 5 then option 10). For a restarted server the job log will look like this.

```
                        Additional Message Information

Message ID . . . . . :   LNT0929       Severity . . . . . :   20
Message type . . . . . :   Diagnostic
Date sent  . . . . . :   09/13/98      Time sent  . . . . . :   11:28:10

Message . . . . :   The Domino server has ended, probably because of an error.
  Trying to restart the Domino server.
Cause . . . . . :   The Domino server has probably encountered an unexpected
  error. When this happens, the Domino server tries to end any related Domino
  jobs and clean up any system resources that have been used.
Recovery  . . . :   Recovery may not be needed. This job will try to restart
  the Domino server.
    If the Domino server fails to start, the console log
  /TMP/DOMINO18.NOTESHST.19980913112810366000000 and the current error
  returned by the restart request will be needed to diagnose any problems.
Technical description . . . . . :   The completion code returned by the
  main Domino server job indicates that the Domino server jobs were ended
                                                                        More...
Press Enter to continue.

F3=Exit   F6=Print   F9=Display message details   F12=Cancel
F21=Select assistance level
```

Figure 58. Job Log of Domino Server after an Automatic Restart

When the server is automatically restarted the console is copied to a temporary file. The name of the file can be found in the job log of the QNNINSTS job. If you put the cursor on to the line that begins with "Domino server has ended,..." and press **F1** then the second level message will appear. This message will tell you where the console file has been copied to. In Figure 58 the console file has been copied to `/TMP/DOMINO18.NOTESHST.19980913112810366000000`. Note, the directory `/TMP` is in the IFS root and not in the Domino data directory.

You can use the *Display Stream File* (DSPSTMF) command to view this file. Since the content of the file is stored in *Lotus Multi Byte Character Set* (LMBCS), you have press **F13** (shift **F1**), to see the contents of the file.

The files in the /TMP directory do not get erased automatically. You will have to periodically display the /TMP directory and delete the old NOTESHST files.

Domino for AS/400 has provided environment variables to assist in problem determination. The first is `AS400_DOMSVR_RESTART`. This environment variable will allow you to control how many times the Domino server should

attempt to auto-restart. The default value is 10 times. If after 10 times the server fails, the Domino server will not restart again. To turn off auto-restart, set the value of this environment variable to 1.

The other environment variable is `NOTES_AS400_STSDEBUG`. If this environment variable is set to 1, then the Domino server will dump all the environment variables and their values when the server is started. This will enable you to determine if the environment variables are set to appropriate values. The environment variables are written to the job log of the QNNINSTS job. Note that these environment variables must be set prior to starting the Domino server.

Chapter 3
Backup and Recovery

The Domino server often contains important business information that may not exist elsewhere in your organization. For example, your users may rely on e-mail for important communications that are not documented anywhere else. Similarly, an online customer service application might contain records that do not exist in hard copy.

To protect the data from disasters (such as a site loss or hardware loss) and from human error, such as accidentally deleting a critical database, develop a good strategy for regularly backing up the information on your Domino server. Make a plan to back up the following:

- Objects that change infrequently, such as programs and configuration data for the Domino for AS/400 software product
- Objects that change regularly, such as your Domino databases

Domino for AS/400 takes advantage of the AS/400 single-level store architecture. Domino databases and programs are spread across all the AS/400 disk units, along with other AS/400 objects. The OS/400 operating system automatically manages the allocation of disk space so that you do not have to decide which databases to store on a particular disk drive.

To back up information on AS/400, you back up logically (by library or directory), not physically (by disk unit). To plan a backup strategy, you need to understand the logical location of your Domino for AS/400 databases and programs.

Note For more information about planning an entire backup strategy including other applications for your AS/400 system, see the book *AS/400 Backup and Recovery*, SC41-5304. It comes with your OS/400 software, and is also available in the softcopy library and on the Web.

Changes in this Chapter

The following changes and additions have been made for the second edition of this redpaper:

On page 147: “Ending the Domino Subsystem” contains a warning not to end the Domino subsystem.

What is the Integrated File System?

Domino for AS/400 stores all Notes databases as stream files in a directory structure within the Integrated File System (IFS). The IFS is a part of OS/400 that supports stream input/output and storage management similar to personal computer and UNIX operating systems, while providing an integrated structure over all information stored in the AS/400 system.

The key features of the Integrated File System are the following:

- Support for storing information in stream files that can contain long continuous strings of data. These strings of data might be, for example, the text of a document or the picture elements in a picture. The stream file support is designed for efficient use in client/server applications.
- A hierarchical directory structure that allows objects to be organized like fruit on the branches of a tree. An object is accessed by specifying the path through the directories to locate the object.
- A common interface that allows users and applications to access not only the stream files but also database files, documents, and other objects stored in the AS/400 system.

Backing Up Domino for AS/400 Objects

When considering saving and restoring for a Domino for AS/400 server, you need to distinguish two different areas of information:

- Programs and configuration data enabling the server to function properly
- Notes databases containing the actual user data

While it is easy to understand that the user data needs to be saved frequently, the need to have recent backup copies of the product data is sometimes overlooked. Even though programs and configuration data change very infrequently, it is still possible that administrators make mistakes or that software failures corrupt information.

Even though a total loss of the entire disk storage is very unlikely, it can still happen due to external disasters (fire, flood, and so forth). While AS/400 disk units can be highly protected against loss of data through hardware failures by using RAID-5 or mirroring, there is no 100% guarantee that even multiple disk units may not fail at the same time - a very unlikely, but not totally impossible, case.

The most likely and common cause of data loss however, is still user errors.

AS/400 Libraries and IFS Directories for the Domino for AS/400 Product

AS/400 libraries contain programs for the Domino for AS/400 server product, programs that are available for your Domino developers to copy to their workstations, and customization information such as subsystem descriptions. The following table lists the Domino libraries:

AS/400 Library	*Content*
QNOTES	Domino for AS/400 product
QNOTESINT	Directory synchronization
QNOTESAPI	C APIs
QNOTESCPP	C++ APIs
QNOTESHTST	HiTest APIs
QNOTESLSKT	LotusScript extensions
QUSRNOTES	Customization information (such as subsystem descriptions)

Directories in the AS/400 integrated file system contain product information, customization files, and databases. The following table lists the Domino directories:

IFS Path	*Content*
/QIBM/ProdData/Lotus/Notes	Product information
/QIBM/UserData/Lotus/Notes	Customization information
Specified when you set up the server (for example /NOTES/DATA)	Directory for databases on the server

Saving the Entire AS/400 System

After you install the Domino for AS/400 software product, including its optional features, you should save a copy of the product. You should also save a copy of the product periodically, for example, when you update to a new release or apply fixes. The following are two options for backing up the libraries and directories that contain the relatively static information for your Domino for AS/400 server. If your AS/400 is already running other applications, you probably already use one of these options.

End All Domino Servers

The procedure described below, requires that all AS/400 applications, including all Domino servers, have to be ended. In order to avoid corrupted Notes databases, you should end all Domino servers in a controlled manner, before saving the system. To do this, on an AS/400 command line, enter the following command:

```
ENDDOMSVR SERVER(Myserver) OPTION(*CTLD)
```

The advantage of using the command shown above is that it can also be coded as part of a CL program that ends the server automatically without operator intervention. See also the example in Figure 60 on page 147.

A convenient way to end all Lotus Domino for AS/400 servers manually, provides the Work with Domino Servers (WRKDOMSVR) command, which was introduced with version 4.6.2 of the product.

Ensure All Domino Jobs are Ended

Before you continue saving the entire AS/400 system you should make sure no jobs related to Lotus Domino for AS/400 are active. An easy way to verify this, is to use the *Work with User Jobs* (WRKUSRJOB) command. On any AS/400 command line enter the following command:

```
WRKUSRJOB USER(QNOTES) STATUS(*ACTIVE)
```

You will see all active jobs running under the QNOTES user profile. Press the **F5** key repeatedly until no jobs are shown.

To back up your entire AS/400 system, including your Domino programs, product files, and databases you can use the SAVE menu, by performing the following steps:

1. Type the following command on any AS/400 command line:

   GO SAVE.
2. Press **Enter**.
3. Press **Page Down (PgDn)** to see the second page of the menu.
4. Enter option **21** (Save the entire system).
5. If your job is not running under the controlling subsystem, you will receive an information message to tell you to transfer your job.

```
SAVE                                  Save
                                                          System:   RCHASM01
 Select one of the following:

   Save System and User Data
     20. Define save system and user data defaults
     21. Entire system
     22. System data only
     23. All user data

   Save Document Library Objects
     30. All documents, folders, and mail
     31. New and changed documents, new folders, all mail
     32. Documents and folders
     33. Mail only
     34. Calendars

                                                                    More...
 Selection or command
 ===> _____________________________________________________________________

 F3=Exit   F4=Prompt   F9=Retrieve   F12=Cancel   F13=Information Assistant
 F16=AS/400 Main menu
```

Figure 59. Save Menu on AS/400

To back up only product libraries and directories that contain information for AS/400 licensed programs, including Domino for AS/400, perform the following steps:

1. Type the following command on any AS/400 command line:

   `GO SAVE`

2. Press **Enter**.
3. Press **Page Down (PgDn)** to see the second page of the menu**.**
4. Enter option **22** (Save system data only).

Option **22** of the SAVE menu includes saving all QNOTESxx libraries as well as the `/QIBM/ProdData/Lotus/Notes` directory.

Saving Domino Databases

Develop a plan to back up all Domino databases, including users' mail databases and system databases, such as the Public Address Book.

When you configure a Domino server, you specify the directory for that server, such as `/NOTES/DATA`. By default, all the databases for the server are in that path. Your Domino administrators may have the authority to place a Domino database in another path (by using an integrated file system command). Typically, users cannot create Domino databases in any location except the default path for the server.

If you are responsible for backing up a Domino for AS/400 server, you should develop a backup strategy that matches your policy for where information is stored.

Saving a Specified Location of Domino Databases

Use a combination of policies and security to keep all Domino databases within the default directory (path) for the Domino server. With this approach, you need to back up only the data directory and the directory that contains customization information (/QIBM/UserData/Lotus/Notes).

Following is an example of the steps to back up the data directory for your Domino for AS/400 server and the directory with customization information. Substitute the name of your tape device for TAP01 and the name of your Domino server data directory for /NOTES/DATA.

1. Start an AS/400 session with a user profile that has *JOBCTL and *SAVSYS special authorities.
2. To ensure that you get a complete copy of your server, you must stop the server before you start the backup operation. Use the following command:

   ENDDOMSVR SERVER(*servername***)**

   where *servername* is the actual name of your Domino server.
3. If you are using directory synchronization, stop the directory synchronization jobs. Use the following command:

   ```
   call qnotesint/qnndiend
   ```
4. To back up the directories, use the *Save Object* (SAV)[1] command. Substitute your directory name for /NOTES/DATA.

   ```
   SAV DEV('/qsys.lib/tap01.devd') OBJ(('/notes/data/*')
   ('/QIBM/UserData/Lotus/Notes/*'))
   ```

   Note If you already use option **21** or option **23** from the SAVE menu regularly, you do not need to back up your Domino server separately.
5. If you are using directory synchronization, back up the AS/400 system distribution directory files (so they are at the same level on your backup tapes as the Domino Public Address Book). Use the following command:

   ```
   SAVOBJ OBJ(qaok*) LIB(qusrsys) OBJTYPE(*file)
     DEV(tap01)
   ```
6. If you are using directory synchronization, restart the directory synchronization job after your backup procedure is complete. Use the following command:

   ```
   call qnotesint/qnndistj
   ```

Saving All Stream File Directories

With this approach, you assume that Domino databases might exist anywhere in the Integrated File System (in either the root directory or the /QOpenSys directory). Therefore, you need to back up the entire root directory and /QOpenSys directory. Use any of the following methods:

---

[1] Note, this is not the same as the *Save Objects* (SAVOBJ) command. SAVOBJ can only be used to save OS/400 library objects, that is, objects in the QYS.LIB file system.

- Save your entire system (**option 21** from the Save menu).
- Save all user data (**option 23** from the Save menu).
- Use the *Save Object* (SAV) command to back up everything except the QSYS.LIB file system, the QDLS file system, and directories that contain static program product information. Substitute your tape device name for TAP01.

```
SAV DEV('/qsys.lib/tap01.devd') OBJ(('/*')
  ('qsys.lib' *omit) ('/qdls.lib' *omit)
  ('/QIBM/ProdData' *omit)
  ('QOpenSys/QIBM/ProdData' *omit)) updhist(*yes)
```

When you use option **21** or **23** from the Save menu, the system automatically stops all activity (goes to a restricted state). When you use commands (instead of the Save menu) to back up your server information, you must stop the server before you back up. This ensures that the databases are
in a known state for the backup operation. You can use the *End Domino Server* (ENDDOMSVR) command to stop the server. If you use directory synchronization, you should also stop the directory synchronization job before you back up using commands. See the instructions in the
previous topic.

Saving Only Domino Mail Databases

This topic describes specifically how to back up mail from your Domino for AS/400 server. If you already have a strategy for backing up all the user information from your Domino server, you probably do not need a separate procedure for backing up only mail. However, you might discover that your backup interval for your entire server is not frequent enough for e-mail because mail is so volatile.

Your Domino server stores mail in multiple databases:

- The MAIL.BOX database on each server contains mail for the server to route to individual user mailboxes or to another server.
- Each Lotus Notes user has an individual mail database. The name of the mail database is typically the user ID with the .NSF extension. (The Domino administrator has the option to use different names for mail databases.) For example, the mail database for user GNELSON is GNELSON.NSF. Typically, all the individual mail databases are in a dedicated subdirectory, such as /NOTES/DATA/MAIL.

To back up mail, do the following:

1. Start an AS/400 session with a user profile that has *JOBCTL and *SAVSYS special authorities.
2. From a command line, use the following command to stop the Domino server:

   ENDDOMSVR SERVER(*servername***)**

   where *servername* is the actual name of your Domino server.

   Note To back up a database, the AS/400 must be able to lock the database so that no changes occur during the backup operation. To successfully back up Notes mail, you will need to stop the Domino for AS/400 server that contains the mail databases.
3. Mount the appropriate backup tape in the tape device.
4. Use the *Save Object* (SAV) command to back up the mail databases. Following is an example. Substitute your server directory name for /NOTES/DATA. Substitute your tape device name for TAP01.

   ```
   SAV DEV('/qsys.lib/tap01.devd')
               OBJ('/notes/data/mail/*.nsf')
   ```

Examples of Backing Up Mail from Your Domino Server

Following are examples of using the *Save Objec*t (SAV) command to back up mail from your Domino server. Substitute your server directory name for /NOTES/DATA. Substitute your tape device name for TAP01.

- To back up a specific database, such as the MAIL.BOX database, use the following command:

```
SAV DEV('/qsys.lib/tap01.devd')
OBJ('/notes/data/mail/mail.box')
```

- To back up all the files of a specific type in the MAIL subdirectory, use the following command:

```
SAV DEV('/qsys.lib/tap01.devd')
OBJ('/notes/data/mail/*.nsf')
```

- To back up a specific user's mail database, such as GNELSON's mail database, use the following command:

```
SAV DEV('/qsys.lib/tap01.devd')
OBJ('/notes/data/mail/gnelson.nsf')
```

Save Specific Databases

You might want to back up a specific Domino database to tape for several reasons. For example:

- To create a backup copy before you make programming changes or test a new agent
- To create an archive copy at the end of an accounting period

To back up a specific database or group of databases from your Domino for AS/400 server, do the following:

1. Start an AS/400 session with a user profile that has *JOBCTL and *SAVSYS special authorities.
2. Ensure that no one is using the database. You want a copy at a known point when no changes are occurring to the database.
3. Mount a tape for the backup operation.
4. Use the *Save Object* (SAV) command for the database. For example, to back up a database called CUSTINF.NSF in the /NOTES/DATA directory, use the following command. Substitute your tape device name for TAP01:

```
SAV DEV('/qsys.lib/tap01.devd')
            OBJ('/notes/data/custinf.nsf')
```

Incremental Backup

AS/400 provides the capability to back up only objects that have changed either since a specific date and time or since the last backup operation. This type of

backup capability is sometimes called an incremental backup. You might find a combination of complete backup and incremental backup particularly useful if your Domino server has many databases that do not change very often.

Strategies for Incremental Backup
Following are the two most common strategies for incremental backups:

- **Backing up changes since the last full backup**. With this strategy, you back up everything that has changed since you last backed up all the databases from your Domino server. For example, assume that you back up your entire server on Saturday night. On Sunday night, you would back up everything that has changed since Saturday night. On Monday night, you would back up everything that has changed since Saturday night. On Tuesday night, you would back up everything that has changed since Saturday night. And so on.

  The advantage of this strategy is that it makes recovery simple. When you need to recover, you need to use only your tapes from your full backup and your tapes from your most recent incremental backup. The disadvantage to this strategy is that your backups grow larger (both in media usage and duration) each day until your next complete backup.

- **Backing up changes since the last incremental backup**. With this strategy, you back up only objects that have changed since the most recent backup. For example, assume that you back up your entire server on Saturday night. On Sunday night, you would back up everything that has changed since Saturday night. On Monday night, you back up everything that has changed since Sunday night. On Tuesday night, you back up everything that has changed since Monday night. And so on.

  The advantage to this strategy is that the size of your incremental backup is smaller (both in media usage and duration). The disadvantage is that recovery is more complex. When you need to recover, you need to use your tapes from your full backup and your tapes from each incremental backup.

Backing Up Changed Objects from Your Domino for AS/400 Server

Following are examples for backing up changed objects from your Domino server. Substitute your server directory name for /NOTES/DATA. Substitute your tape device name for TAP01.

Backing Up All Changes Since Previous Full Backup
To perform a nightly incremental backup of all changes that have occurred since that last full backup, do the following:

1. On Saturday evening, perform a complete backup (for example, by using option **23** from the Save menu). Make sure that you specify UPDHST(*YES) on the SAV command so that the system updates the object information with the time and day of the most recent backup.
2. On Sunday evening, use the following command:

```
SAV DEV('/qsys.lib/tap01.devd') OBJ('/notes/data/*.*')
       CHGPERIOD(*lastsave) updhst(*yes)
```

3. On Monday evening, use the following command:

```
SAV DEV('/qsys.lib/tap01.devd') OBJ('/notes/data/*.*')
       CHGPERIOD(*lastsave) updhst(*yes)
```

Continue using the same command every night until your next full backup.

Backing Up One Day's Changes

To perform a nightly incremental backup of what has changed since the previous incremental backup, you need to adjust the CHGPERIOD parameter each night. Following is an example:

1. On Saturday evening at 8 PM, perform a complete backup (for example, by using option **23** from the Save menu). Make sure that you specify UPDHST(*YES) on the SAV command so that the system updates the object information with the time and day of the most recent backup.
2. On Sunday evening, November 9 at 10 PM, use the following command:

```
SAV DEV('/qsys.lib/tap01.devd') OBJ('/notes/data/*.*')
       CHGPERIOD('11/08/97' 200000) updhst(*yes)
```

3. On Monday evening, November 10 at 9 PM, use the following command:

```
SAV DEV('/qsys.lib/tap01.devd') OBJ('/notes/data/*.*')
       CHGPERIOD('11/09/97' 220000) updhst(*yes)
```

4. On Tuesday evening, November 11 at 8 PM, use the following command:

```
SAV DEV('/qsys.lib/tap01.devd') OBJ('/notes/data/*.*')
       CHGPERIOD('11/10/97' 210000) updhst(*yes)
```

5. Each evening, run the SAV command. Alter the Change Period parameter to the time and date of the previous backup.

Reduce the Downtime of Your Servers

To reduce the downtime of your servers during backups, you can use one or both of the following methods:

- **Use clustered servers.** AS/400 can support clustered servers on the same system. Therefore you can bring down one of the servers, while another server takes over serving the clients and you then save the other server's databases. After that, you do the same for the other server.
- **Use Save files.** If you have sufficient storage space on disk, you can save the contents of your IFS directories to a Save file. This can be much faster than saving directly to tape. After saving to the Save file, you can start the server again and the actual save-to-tape process can be started now or even at a later time.

To create a save file, you use the *Create Save File* (CRTSAVF) command. Assume you want to create a save file called `DOMINOSAVF` in library `NIGHTSAVES`. You would use the following command:

```
CRTSAVF SAVF(NIGHTSAVES/DOMINOSAVF) TEXT('Domino Backup')
```

Then you would save all Domino databases in directory /Notes/AcmeDS1 using the following command:

```
SAV DEV('/QYSS.lib/NIGHTSAVES.lib/DOMINOSAVF.file')
       OBJ(('/Notes/AcmeDS1/*')) CLEAR(*ALL) DTACPR(*YES)
```

Note To specify the name and library for the Save file, a different syntax has to be used for the SAV command and the CRTSAVF command (and all other commands dealing with Save files). The reason is that the *Save Object* (SAV) command uses IFS object naming conventions.

The parameter **`CLEAR(*ALL)`** ensures that the current content of the Save file is overwritten. This means that you can use the same Save file every night.

The parameter **`DTACPR(*YES)`** specifies that data compression should be used. This needs more processor resources and may take more time, but the amount of disk storage needed is much less.

Avoiding Object Locks When Saving Notes Databases

To back up a database, the AS/400 must be able to lock the database so that no changes occur during the backup operation. To successfully back up Notes mail, do one of the following *before* you use the *Save Object* (SAV) command:

- Stop activity on the database file by using the Domino console commands **drop all** and **dbcache flush**. However, with this method, any attempted mail delivery during the backup operation results in the mail being returned to the user with a message that the server is busy or in use.
- Stop the Domino for AS/400 server that contains the mail databases. Use the *End Domino Server* (ENDDOMSVR) command to stop the server.

The advantage of the latter method is that you can automate the process by writing a CL program and running it nightly under the control of the OS/400 job scheduler. Figure 60 shows an example of such a CL program.

```
0001.00 PGM
0002.00 ENDDOMSVR AcmeDS1 *CNTRLD
0003.00   MONMSG CPF0000
0004.00 DLYJOB DLY(600)
0005.06 SAV DEV('/QYSS.lib/NIGHTSAVES.lib/DOMINOSAVF.file') +
0005.07           OBJ(('/Notes/AcmeDS1/*')) CLEAR(*ALL) DTACPR(*YES)
0005.08 DLCOBJ OBJ((QUSRNOTES/DOMINO01 *SBSD *EXCL))
0006.00   MONMSG CPF0000
0007.00 STRDOMSVR AcmeDS1
0008.00   MONMSG CPF0000
0009.00 ENDPGM
```

Figure 60. Example CL Program to Backup Domino for AS/400

The idea of the program shown in Figure 60 shows how to end the Domino server in a controlled way before starting the save process. The difficulty is that it may take an unknown amount of time for all server functions to actually end. One solution *is* to delay the execution of the program for a predefined time interval after submitting the *End Domino Server* (ENDDOMSVR) command.

Ending the Domino Subsystem

Caution Do **not** end the Domino subsystem using the *End Subsystem* (ENDSBS) as part of your backup procedure. This may cause the server to restart immediately after the *End Domino Server* (ENDDOMSVR) command has been executed.

Recovery of Domino for AS/400 Objects

Domino for AS/400 programs and product files reside in libraries in the QSYS.LIB file system on your AS/400. Domino databases reside in the integrated file system in a directory path that you specify when you configure your server. Your backup strategy for Domino for AS/400 should include backing up both the libraries (infrequently) and the database directories (frequently).

You might need to recover Domino for a variety of reasons, for example:

- User or operator error, such as deleting a database or running a month-end procedure twice.
- Damage to your server, such as fire or flood.
- Hardware problems, such as a disk failure.

Note AS/400 provides disk protection options (mirrored protection and device parity protection) both to increase availability and to ensure that failures of a single disk unit do not cause loss of data. You can find out more about disk protection in the book *OS/400 Backup and Recovery*, SC41-5304.

Sometimes, you must recover your entire server. Other times, you must restore a specific directory or a single database. The following topics provide general information about recovery steps for Domino for AS/400.

- Recovering an entire Domino server
- Recovering Domino mail
- Recovering Domino databases
- Restoring changed objects to a Domino server

For complete procedures and considerations, see the AS/400 *Backup and Recovery* book and the Domino documentation.

Recovering the Entire Domino for AS/400 Server

If you are faced with a system disaster, such as a site loss or the failure of an unprotected disk unit, you must restore your entire AS/400 system from a backup. Because AS/400 is a highly integrated system, you must recover objects in the correct sequence to rebuild the proper links between objects. The book *OS/400 Backup and Recovery*, SC41-5304 provides complete instructions for performing a full system recovery.

If you are faced with a problem that requires recovering only your Domino for AS/400 server, not your entire AS/400 system, you can use the *Restore Object* (RST)[2] command to reload your Domino directories from tape. Following is an example of the steps:

1. Sign on your AS/400 using a user profile that has *SAVSYS and *JOBCTL special authority.
2. To make sure that no one is using the server that you plan to recover, stop the server. Use the *End Domino Server* (ENDDOMSVR) command.
3. If you use directory synchronization, stop the directory synchronization function, using the following command:

   ```
   call qnotesint/qnndiend
   ```

4. Mount the tape that has the most recent backup copy of the directories for the server.
5. Use the appropriate restore (RST) command for your Domino directory. For example, if your Domino directory is /NOTES/DATA and your tape device is TAP01, use the following command:

   ```
   RST DEV('qsys.lib/tap01.devd') OBJ('/notes/data/*')
   ```

6. If you use directory synchronization, you should also restore the AS/400 system distribution directory from a backup created the same time as your Domino Address Book was saved.

This process restores the physical contents of the data directory for your server to your AS/400 disk storage. Consult the Domino documentation for any special

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[2] Note that this is not the same as the *Restore Objects* (RSTOBJ) command. RSTOBJ can only be used to restore OS/400 library objects, that is, objects in the QYS.LIB file system.

recovery activities that you might need to perform after you have restored the directories.

Restoring the AS/400 System Distribution Directory

If you use directory synchronization between your Domino Public Address Book and your AS/400 system distribution directory, special considerations apply during recovery. If possible, you should restore both the Domino Public Address Book and the AS/400 system distribution directory from backup tapes that were created at the same time. If you cannot recover them both from a matching backup, you need to use the populate capability of directory synchronization to ensure that they match.

To restore the AS/400 system distribution directory, do the following:

1. Stop the directory synchronization function, using the following command:

   ```
   call qnotesint/qnndiend
   ```

2. Use the following restore command:

   ```
   RSTobj OBJ(qaok*) SAVLIB(qusrsys) OBJTYPE(*file)
   DEV(tap01)
   ```

3. When your recovery is complete, use the following command to restart directory synchronization:

   ```
   call qnotesint/qnndistj
   ```

For more information on directory synchronization, see “What is Directory Synchronization?” in Chapter 5.

Recovering Domino Mail

If you need to reload one or more mail databases from your backup tapes, use the *Restore Object* (RST) command. Following is an example of the steps:

1. Start an AS/400 session with a user profile that has *SAVSYS and *JOBCTL special authorities.
2. Stop the server that contains the mail databases that you want to recover; for example, use the *End Domino Server* (ENDDOMSVR) command.
3. Mount the tape that has the most recent backup of the mail databases.
4. Use the appropriate *Restore Object* (RST) command for the mail databases that you want to recover. For example, to restore all the databases to the MAIL subdirectory from device TAP01, use the following command.

   ```
   RST DEV('/qsys.lib/tap01.devd') OBJ('/notes/data/mail/*')
   ```

Examples

The name of a user's mail database is usually the user ID (short name) with the .NSF extension. (The Domino administrator has the option to use different names for mail database files.)

- To recover a specific user's mail database, such as the mail database for user GNELSON, use the RST command and specify the database name:

```
RST DEV('/qsys.lib/tap01.devd')
OBJ('/notes/data/mail/gnelson.nsf')
```

- You can specify more than one file on the RST command. To restore mail databases for GNELSON, LSMITH, and JPETERS, use the following command:

```
RST DEV('/qsys.lib/tap01.devd')
OBJ(('/notes/data/mail/gnelson.nsf')
('/notes/data/mail/lsmith.nsf')('/notes/data/mail/
jpeters.nsf'))
```

Notes About the Examples

- In this example we do not end the server. However, you cannot restore a database that is in use by a Notes user. All users must close the database before you can restore a backup copy.
- All of the examples assume that the directory for your Domino server is /NOTES/DATA.
- Substitute the name of your AS/400 tape device for TAP01.

Recovering Domino Databases

You might need to recover a specific Domino database or a group of databases. Use the *Restore Object* (RST) command. Following is an example of the steps for recovering all the files to the HRDPT subdirectory:

1. Sign on your AS/400 using a user profile that has *SAVSYS and *JOBCTL special authorities.
2. Stop the server that contains the databases that you want to recover. Use the *End Domino Server* (ENDDOMSVR) command. (You can restore a database when the server is running. However, you need to make sure that no one is using the database. Stopping the server is the best way to ensure that no one is using the database.)
3. Mount the tape that has the most recent backup of the databases.
4. Use the appropriate *Restore Object* (RST) command for the mail files that you want to recover. For example, to recover all the files to the HRDPT subdirectory from device TAP01, use the following command:

```
RST DEV('/qsys.lib/tap01.devd')
OBJ('/notes/data/hrdpt/*.nsf')
```

Note You cannot restore a database that is in use. All users must close the database before you can restore a backup copy. The best way to ensure that databases are not in use is to stop the server.

Restoring Changed Objects to a Domino for AS/400 Server

To reduce the length of your backup window, your backup strategy might include backing up only changed objects from your Domino server during the business week. When you need to use these backup tapes to recover, you must decide on your recovery sequence and determine the location of the most recent copy of each database.

Examples

Following are examples of different recovery scenarios and an overview of the recovery steps for each. Substitute your server directory for /NOTES/DATA. Substitute your tape device name for TAP01.

Recovering All Changed Domino Objects from a Cumulative Backup

Assume that your strategy for backing up changed objects is cumulative (each night you back up everything that changed since the last complete backup). To recover your entire Domino data directory, do the following:

1. Start an AS/400 session with a user profile that has *JOBCTL and *SAVSYS special authorities.
2. To ensure that no one is using the databases, stop the Domino server; for example, use the *End Domino Server* (ENDDOMSVR) command.
3. Locate the tapes from your most recent complete backup. Mount the correct tape in the tape unit.
4. To recover the entire Domino data directory, use the *Restore Object* (RST) command. For example,

   ```
   RST DEV('/qsys.lib/tap01.devd') OBJ('/notes/data/*')
   ```

5. Locate and mount your most recent backup tapes (from backing up changed objects).
6. To recover all the changed objects on the tape (everything that has changed since your full backup), use the following command:

   ```
   RST DEV('/qsys.lib/tap01.devd') OBJ('/notes/data/*')
   ```

   Substitute your Domino data directory for /NOTES/DATA and your tape device name for TAP01.

Recovering All Changed Domino Objects from a Nightly Backup

Assume that your strategy for backing up changed objects is nightly (each night you back up only objects that have changed since the previous night). To recover your entire Domino directory, do the following:

1. Start an AS/400 session with a user profile that has *JOBCTL and *SAVSYS special authorities.
2. To ensure that no one is using the databases, stop the Domino server; for example, use the *End Domino Server* (ENDDOMSVR) command.
3. Locate the tapes from your most recent complete backup. Mount the correct tape in the tape unit.
4. To recover the entire Domino database directory, use the Restore Object (RST) command. For example,

   ```
   RST DEV('/qsys.lib/tap01.devd') OBJ('/notes/data/*')
   ```

5. Locate and mount your first backup tapes (from backing up changed objects). For example, if you back up everything on Saturday night, locate your backup tapes from Sunday night.
6. To recover all the changed objects on the tape (everything that has changed since the previous night), use the following command:

   ```
   RST DEV('/qsys.lib/tap01.devd') OBJ('/notes/data/*')
   ```

   Substitute your Domino data directory for /NOTES/DATA and your tape device name for TAP01.
7. Repeat steps 5 and 6 for each nightly backup tape until your directory is current. For example, if you are recovering on Thursday, you need to use the tapes for Monday, Tuesday, and Wednesday nights.

Recovering a Specific Domino Database from an Incremental Backup

To recover a specific database named HRINFO to the HRDPT subdirectory (folder), do the following:

1. Start an AS/400 session with a user profile that has *JOBCTL and *SAVSYS special authorities.
2. To ensure that no one is using the databases, stop the Domino server; for example, use the *End Domino Server* (ENDDOMSVR) command.
3. Locate the most recent tape that has the database. Do one of the following:
   - Consult the log that the system creates during the save operation.
   - Use the *Display Tape* (DSPTAP) command to display the contents of the tape.
4. Mount the tape in the tape unit.
5. To recover the database, use the following command:

   ```
   RST DEV('/qsys.lib/tap01.devd')
   OBJ('/notes/data/hrdpt/hrinfo.nsf')
   ```

   Substitute your tape device name for TAP01.

Recovering Changed Objects to a Specific Domino Subdirectory

To recover all the Domino databases to the CUSTSVC subdirectory, use the same approach that you use to recover the entire server. Do the following:

1. Sign on your AS/400 using a user profile that has *JOBCTL and *SAVSYS special authorities.
2. To ensure that no one is using the databases, stop the Domino server; for example, use the *End Domino Server* (ENDDOMSVR) command.
3. Locate the tapes from your most recent complete backup. Mount the correct tape in the tape unit.
4. To recover the entire directory from the tapes from your last full backup, use the *Restore Object* (RST) command. For example, to recover objects in the CUSTSVC subdirectory from the TAP01 device, use the following command:

   ```
   RST DEV('/qsys.lib/tap01.devd')
   OBJ('/notes/data/custsvc/*')
   ```

5. If your incremental backup tapes are cumulative, mount your most recent incremental backup tape. Use the same command (step 4) to recover the changes.

   Otherwise, if your backup tapes are nightly, repeat this step for each incremental backup tape. Start with the oldest tape and work forward, using the RST command from step 4.

Chapter 4
Mail Integration Through the SMTP/MIME MTA

This chapter describes how Domino mail integrates with OS/400-based e-mail. The Internet standard Simple Mail Transfer Protocol (SMTP) with its complement Multipurpose Internet Mail Extensions (MIME) was chosen as the common mail protocol between Notes mail and AnyMail/400, the Mail Server Frame Work (MSF) in OS/400.

Domino for AS/400 mail integration not only allows for exchanging mail between Notes mail users (connected to the Domino for AS/400 server) with OfficeVison/400 Users on the same or other AS/400 systems, but also with other users of SMTP/MIME based mail applications, either on or connected to the AS/400 system through the Internet or Intranet.

To accomplish the integration between Domino and OS/400 mail, two software components are involved:

- The SMTP/MIME support of the TCP/IP Connectivity Utilities licensed program[1] (5796-TC1). For simplicity we will call this *OS/400 SMTP support*.
- The Lotus SMTP/MIME MTA (Message Transfer Agent). In the rest of the chapter we refer to it simply as MTA[2].

The main focus of this chapter is on installing and configuring the SMTP/MIME MTA on a Domino for AS/400 server. Prerequisite for this is to have the TCP/IP configuration on OS/400 set up correctly to support the OS/400 SMTP server. We briefly describe this topic first and also how the MTA interacts with OS/400 SMTP via the AnyMail framework.

Finally we explain how to specify addresses and to send mail between these different e-mail environments.

[1] The AS/400 TCP/IP function is divided between the OS/400 operating system and the TCP/IP Connectivity Utilities for AS/400 Licensed Program (LP). When you purchase OS/400, the ordering system automatically places an order for the TCP/IP Utilities LP. The TCP/IP Utilities LP is shipped with OS/400 at no additional charge. However, the TCP/IP Utilities LP must be separately installed by using normal installation support.

[2] Note, Domino also has other kinds of MTAs, for example, the X.400 MTA or the cc:Mail MTA. Only the SMTP/MIME MTA is currently supported on Domino for AS/400.

Changes in this Chapter

The following changes and additions have been made for the second edition of this redpaper:

On page 170: "Change the Distribution Attributes" describes an additional step needed when setting up the SMTP MTA in combination with OfficeVision/400.

On page 179: "Language Dependent Character Set Conversions" describes how to configure the MTA to convert character sets different from US-ASCII.

On page 209: "Mixed Address Lists Not Sent to Every Recipients" addresses a problem when sending mail from OfficeVison/400 to Domino.

Domino and AS/400 Mail Capabilities Overview

Before looking in detail at the Domino for AS/400 mail integration, you should have an understanding of the e-mail environment on AS/400, as well as Domino, before these two worlds of e-mail are integrated.

AS/400 Mail Capabilities

The traditional mail application on an AS/400 system is OfficeVision for AS/400 (OV/400) allowing users of 5250 and 3270 terminals to exchange mail (besides other functions like word processing, maintaining calendars and others). Exchange of mail with other systems was originally only accomplished through Systems Network Architecture Distribution Services (SNADS). The format of the mail being handled by OV/400 is based on the Document Content Architecture/Document Interchange Architecture (DCA/DIA).

The implementation of the AnyMail/400 Mail Server Framework (MSF) in OS/400 V3R1, now also allows OV/400 users to exchange mail with other e-mail applications, for example applications on the Internet using SMTP/MIME format. Exit programs for AnyMail/400 convert the mail formats between DCA/DIA and SMTP/MIME.

A recent enhancement of OS/400 also allows POP3 clients to connect to an AS/400 system to send and receive Internet mail based on SMTP/MIME. POP3 clients can also exchange mail with OV/400 on the same and other AS/400 systems through AnyMail/400.

Thus users of an AS/400 system can exchange mail in two different formats:

- DCA/DIA-based mail with other OfficeVision[3] systems
- SMTP/MIME mail with any application supporting SMTP/MIME and POP3 or IMAP4 clients

[3] This includes also OfficeVision for VM and OfficeVision for MVS as well as other mail applications supporting DCA/DIA and SNADS.

For more information on AS/400 mail functions, refer to the redbook *AS/400 Mail Capabilities*, SG24-4703.

Lotus Domino as a Mail Server

One of the basic functions of Lotus Notes is exchange between Notes clients connected to:

- The same Domino server
- Other Domino servers in the same domain
- Domino servers in other domains

Instead of using a Notes client workstation, users can also send and receive mail via a Domino server using a POP3 or IMAP4 client, both Internet standards for e-mail.

Exchange of mail between Domino servers and mailing applications using different formats can be done by installing Message Transfer Agents (MTA), for example the SMTP/MIME MTA, X.400 MTA, or cc:Mail MTA. Domino for AS/400 only supports the SMTP/MIME MTA as described in detail later in this chapter. Thus Domino for AS/400 can exchange mail in two different formats:

- Notes mail with other Domino servers and Notes clients
- SMTP/MIME mail with any application supporting SMTP/MIME and POP3 or IMAP4 clients

Combining the Mail Environments of Domino and OS/400

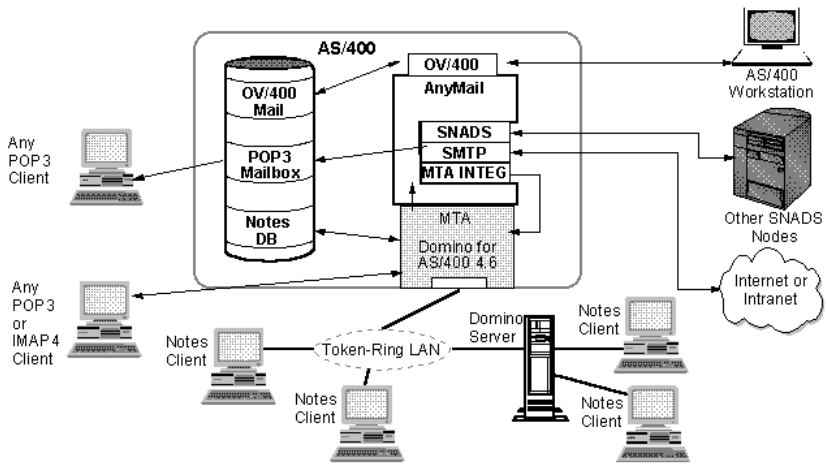


Figure 61. Combining the Mail Environments of Domino and OS/400

As a conclusion of the previous two sections, you can see that AS/400 based mail applications and Domino for AS/400 support one common mail format: SMTP/MIME.

Through SMTP/MIME MTA and AnyMail/400, not only does the exchange of mail between Domino for AS/400 and OV/400 become possible, but the OS/400 SMTP support also allows sending mail to and receiving mail from
any Internet-based mail application as long as there is a connection to the AS/400 system.

What Is the Domino for AS/400 SMTP/MIME MTA?

Originally developed as a separate product, the Lotus Notes SMTP/MIME MTA is now an integrated component of all Domino 4.6 servers. A Message Transfer Agent (MTA) is a program that runs under the control of a Domino or Notes server to exchange messages ("mail") with mail applications using different mail protocols. The Simple Message Transfer Protocol/ Multipurpose Internet Mail Extensions (SMTP/MIME) is a standard based on TCP/IP and is often used to connect unlike mail systems.

On the other hand, AS/400-based mailing applications such as OfficeVision for OS/400 can also use the OS/400 SMTP support to convert from and to SMTP, thus allowing direct mail exchange with a Domino for AS/400 server on the same or other AS/400 systems.

The MTA provides advanced messaging features and extensions to the Domino 4.6 server, allowing it to transfer messages in SMTP/MIME format via TCP/IP networks, which can be the Internet, connecting to many other companies, or the Intranet within just one company.

While the MTA implementation is similar for Domino servers on all platforms, there is one important difference: the MTA on a Domino for AS/400 server does not *directly* communicate with the TCP/IP network. It rather sends and receives mail through the OS/400 SMTP support and AnyMail, the Mail Server Framework (MSF). This results in some differences with installation and configuration for the AS/400 system.

The AS/400 installation and configuration steps for the MTA are highlighted in the following sections. For additional information on configuring and using the MTA on a Domino server in general, see the *Domino Administration Help* database (doc\HELPADMN.NSF) or chapter 4 of the book *Extending your Domino Server*; for specific information on the MTA for Domino for AS/400 see the *Domino for AS/400 Help* database (AS400DOC.NSF).

The SMTP/MIME MTA is based on Internet Request for Comments (RFCs). Among the RFCs supported are:

RFC821	Simple Mail Transfer Protocol
RFC822	Standard for the Format of ARPA Internet Text Messages
RFC1521	MIME: Part I (message bodies)

RFC1522	MIME: Part II (message headers)
RFC974	Mail Routing and the Domain System
RFC1123	Requirements for Internet Hosts - Application and Support

The contents of each RFC can be viewed from a Web browser. For example, the following Web sites describe RFC821:

`http://info.internet.isi.edu/in-notes/rfc/files/rfc821.txt`

`http://www.rfc-editor.org/`

Setting Up the OS/400 SMTP Server

The following tasks need to be performed before you can use Domino for AS/400 mail integration:

- Install the TCP/IP Connectivity Utilities Licensed Product (5769-TC1)
- Verify or complete the TCP/IP configuration for SMTP
- Start and verify the OS/400 SMTP server
- Change the distribution attributes (if you use OfficeVision/400)
- Verify QSNADS Subsystem was started
- Set up a Domino for AS/400 server with the SMTP/MIME MTA
- Open and save the MTA Configuration Documents at least once
- Restart the AnyMail Mail Server Framework
- Start the MTA on the Domino server

The following topics describe each of these tasks.

Install the TCP/IP Utilities Licensed Product (5769-TC1)

The support for TCP/IP communications to allow Notes clients to connect to the Domino for AS/400 is part of the AS/400 operating system OS/400. However, the basic OS/400 software does not include the SMTP mail server support, as needed for Domino for AS/400 mail integration. To obtain the SMTP mail support, you need to install the TCP/IP Connectivity Utilities for AS/400 (Program number 5769-TC1).

To verify if the TCP/IP Connectivity Utilities are installed, you can use the *Work with Licensed Programs* (GO LICPGM) command and then option **10**, or use the *Display Software Resources* (DSPSFWRSC) command. Check for the software (or resource) ID 5769TC1.

Use the *Work with Licensed Programs* (GO LICPGM) menu and then option **11** to install the TCP/IP Connectivity Utilities from your AS/400 CD-ROM. See chapter 5 of the book *Software Installation,* SC41-5120-01, for more information.

Verify or Complete the TCP/IP Configuration for SMTP

Even though TCP/IP is already working on your AS/400 system, the configuration may not be complete to allow the SMTP server to work correctly. Some important topics to look at are:

- Which SMTP domain(s) should the SMTP server represent and accept incoming mail for?
- Is there a Domain Name System (DNS) in place to allow name servers to resolve host names to IP addresses?
- Are mail routers being used to forward SMTP mail to the destination host?

Your Mail Server's SMTP Domain

Any SMTP mail address has the form *username@SMTPdomain*. The part on the left of the @ sign describes the user's name, or better the user's mail box name and is defined by the mail application being used. The SMTP domain[4] name on the right side of the @ sign must be a valid host name for the receiving system, that is it must be possible to resolve this name to an IP address assigned to a network interface at the receiving system.

In the case of OS/400 SMTP support this means it is not enough to define the AS/400 TCP/IP host name and domain name, you also have to make sure it appears either in a domain name system (DNS) or in the local hosts table.

What is a Domain?

Unfortunately, the term domain is used multiple times with different meanings, depending on the context. Throughout this book and specially in this section, make sure you understand exactly what domain we are talking about. There are three different environments where we talk about a domain name:

- **SMTP Domain**

  This is the partial SMTP address on the right of the @ sign describing the IP host name of the computer where the SMTP user's mail application is running.

- **TCP/IP Domain**

  This is the right part of the fully qualified host name used to identify the TCP/IP network. For example, if the full host name is:

  `SYSTEM01.DOMLAND.ACME.COM`

  Then the domain name is:

  `DOMLAND.ACME.COM`

[4] The term SMTP domain is not at all related to a Notes or Domino domain, nor is it the same as the TCP/IP domain, although the latter can be a part of the SMTP domain name.

- **Lotus Notes or Domino Domain**

  This term has absolutely nothing to do with TCP/IP. A Notes Domain consists of one or more Domino servers that all share, that is use a replica of the same Public Address Book (PAB). Therefore, each server knows the home mail server for all users in the same domain. The Notes domain name should also not be confused with the organization or the organizational unit. When installing a new Domino server, the default for domain name is identical to the organization name; however, they don't have to be the same. In Notes terminology, the domain name is specified by a preceding @ sign, while the organizational unit is preceded by a forward slash (/). For example, **WBL/ITSO@itsc_respop** specifies a user **WBL** in the organizational unit **ITSO** on the Notes domain **itsc_respop**.

Define the TCP/IP Host and Domain Name for the AS/400

The first step in setting up a correct TCP/IP configuration is to set the AS/400's host name and domain name. You can do so using the *Configure TCP/IP* (**CFGTCP**) command and then entering option **12**, or by keying the *Change TCP/IP Domain* (CHGTCPDMN) command and pressing **F4**. In either case you will see the prompt as shown in Figure 62.

```
                    Change TCP/IP Domain (CHGTCPDMN)

Type choices, press Enter.

Host name  . . . . . . . . . . .   system01
Domain name  . . . . . . . . . .   domland.acme.com

Host name search priority  . . .   *REMOTE        *REMOTE, *LOCAL, *SAME

  Internet address . . . . . . .   '10.1.10.10'
                                   '10.1.10.11'


                                                                      Bottom
F3=Exit   F4=Prompt   F5=Refresh   F10=Additional parameters   F12=Cancel
F13=How to use this display        F24=More keys
```

Figure 62. Change TCP/IP Domain (CHGTCPDMN) Prompt

Now you should enter a local TCP/IP host name and the TCP/IP domain name. The combination of these two names is referred to as the *fully-qualified local host name* and is the name by which this host is known to the network. The host name, whether by itself or fully-qualified, is sometimes referred to as the *SMTP domain*.

If a Domain Name System (DNS) exists, you should also specify the IP addresses of your name server(s) and whether or not the local host table should be searched before the name server's tables.

Tip The title of the last two parameters ("Internet address") may be somewhat misleading: It is *not* the Internet address for the AS/400, it is rather the address of one or more name servers for the DNS. Pressing **F1** for help gives you the correct explanation.

Include the Host Name in the Host Table

The SMTP server needs to know which of the mail it receives on port 25 is destined for which user on this system. The way it does this is parsing the recipient address of the incoming mail and looking at the part to the right of the @ sign, called the *SMTP domain*. A piece of mail will be accepted, if the SMTP domain can be resolved to any IP address which is assigned to a local IP interface. This can only be done, if this name is registered in either the AS/400 system's local host table, one or more name servers, or both.

A part of the TCP/IP configuration often forgotten if local host tables on the clients or Notes connection documents are being used, is to add the AS/400 system's own simple and fully qualified host name to the host table on the AS/400 system. This is only necessary if there is no name server or the AS/400 host name is not registered on a name server. However, especially when setting up for SMTP mail, it is a good idea to add this entry to the host table.

To add a name to the local host name, you can either use the *Configure TCP/IP* (CFGTCP) command and then option **10** followed by option **1**, or by typing the *Add TCP/IP Host Table Entry* (ADDTCPHTE) command in any command line and pressing **F4**. In either case, you will see the prompt as shown in Figure 63.

```
                    Add TCP/IP Host Table Entry (ADDTCPHTE)

Type choices, press Enter.

Internet address . . . . . .   10.1.2.217
Host names:                    _
  Name . . . . . .             system01
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________
               + for more values +
Text 'description' . . . . . .   _____________________________________
_____________________________

                                                                Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 63. Add TCP/IP Host Table Entry (ADDTCPHTE)

Make sure to enter the correct IP address as well as the same host name as you did with the *Change TCP/IP Domain* (CHGTCPDMN) command. Press the **Tab** key, enter a plus sign (+) into the small field and press **Enter**. You will see the *Specify More Values for Parameter HOSTNAME* prompt as shown in Figure 64.

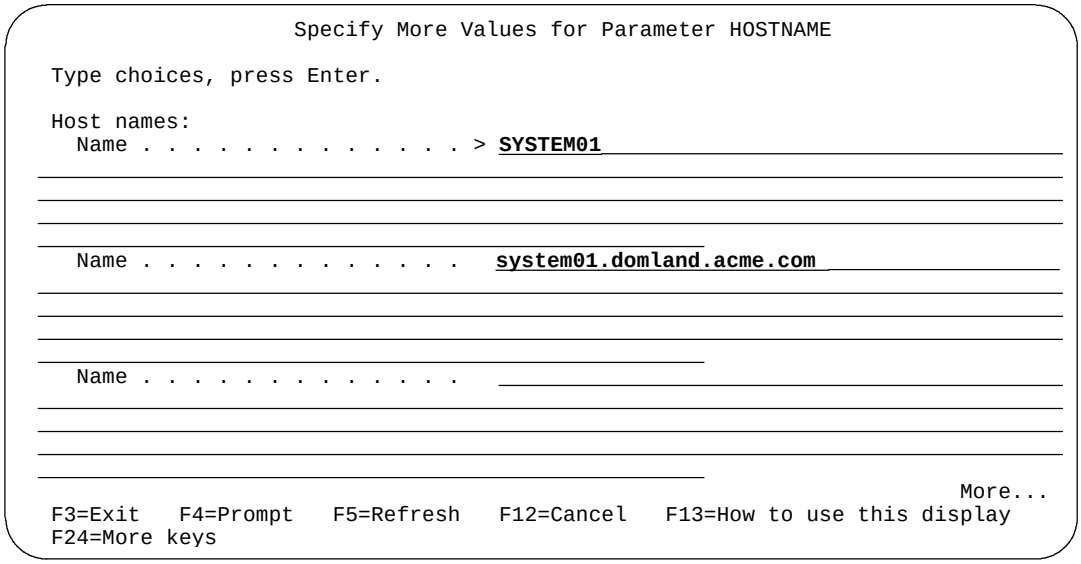

Specify More Values for Parameter HOSTNAME
Type choices, press Enter.
Host names:
Name . . . . . > SYSTEM01
Name system01.domland.acme.com
Name . . . . . .
More...
F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display
F24=More keys

Figure 64. Specify More Values for Parameter HOSTNAME

Press the **Tab** key again to reach the second name field (this field spans 4 lines on your display) and enter the **fully qualified** host name, that is both names shown in Figure 62 concatenated with a dot. If you want your AS/400 to represent more than one SMTP domain, you can even enter more names - up to 4 per IP address (see next paragraph).

A Single AS/400 Known by Multiple SMTP Domain Names

A common requirement for setting up SMTP/MIME for mail serving on an AS/400 in a TCP/IP network is to allow a single AS/400 to be known by multiple host domain names. For example a single mail server has POP3 users Smith@acmeA.com, Smith@acmeB.com, Smith@acmeC.com, etc. where these users are distinct Domino, POP3 or OV/400 users that are all different "local"[5] users to the AS/400. This would be done in a case where an AS/400 was serving as a mail server for multiple companies. Each company might want its own distinct host domain name and also not have to be concerned about any other SMTP users named "Smith" defined on the same AS/400 mail server.

The following is the recommended approach to allow a single AS/400 system to receive mail for multiple TCP/IP host domain names. The method used is to define multiple IP addresses for a single AS/400 system. These multiple IP addresses could each be associated with a physical interface or there can be multiple logical IP addresses defined for each physical interface[6]. You can use the Add TCP/IP

[5] Note, in this context, users of a Domino for AS/400 server are also considered as "local." This is different to the implementation on the Integrated PC Server (IPCS), where the IPCS is a different TCP/IP host even though it resides under the covers of the AS/400 system unit.

[6] An AS/400 RISC system can support up to 128 logical IP addresses per physical interface, up to a maximum of 512 logical IP addresses per system.

Interface ADDTCPIFC command to define additional logical IP addresses to a physical line[7]. Once you've defined an IP address for each company, you'll need to define a distinct SMTP domain name (of the form *hhh.ddd* where *hhh* is a TCP/IP host name and *ddd* is a TCP/IP domain name) to each IP address, for example, acmeA.com, acmeB.com, acmeC.com, etc. The association of names with addresses should be done using a DNS (domain naming service) server if one is present in the network. Otherwise, the host table can be used to accomplish it (see previous topic). Once the AS/400 has been defined to have multiple IP addresses and *hhh.ddd* names then mail can be sent to any of these *hhh.ddd* names and it will be routed to and processed as "local" on that AS/400 system.

When local POP3 users are defined in the SDD they can use any of the *nnn.ddd* names that are defined for an AS/400 system. The SMTP user name must be unique for that host domain name. Restated, using this approach allows distinct POP3 users that all might just happen to have the same SMTP user name "Smith" to receive SMTP/MIME messages addressed to different *hhh.ddd* names, for example smith@acmeA.com, smith@acmeB.com, smith@acmeC.com, etc., even though they are actually local POP3 users on the same physical AS/400 server.

Although, as explained above, more than one user can have the same SMTP user name (provided they have different *hhh.ddd* names), it is important to note that each unique POP3 mailbox is associated with one and only one AS/400 user profile. Therefore, in the above example of three SMITHs on the same AS/400, all three CANNOT have a user profile of SMITH. They had have to be different, say, SMITH1, SMITH2 and SMITH3.

Start and Verify the OS/400 SMTP Server

By default the SMTP server is started whenever you start TCP/IP (using the *Start TCP/IP* (STRTCP) command). However, the default may have been changed or the server may fail when attempting to start. Therefore it is a good idea to verify if the SMTP is running. You can do so using the *Work with TCP/IP Network Status* (NETSTAT) command. On any AS/400 command line, key the following command and press **Enter**:

```
NETSTAT *cnn
```

You will see a panel like the one shown in Figure 65. Make sure you see a row with *local port* showing SMTP or the number 25.

[7] Each physical line has a line description. Use the *Work with Line Descriptions* (WRKLIND) command to display or change the existing or create new line descriptions.

```
                    Work with TCP/IP Connection Status
                                                                System:   SYSTEM01
Local internet address  . . . . . . . . . . . :   *ALL

Type options, press Enter.
  4=End   5=Display details

     Remote           Remote     Local
Opt  Address          Port       Port       Idle Time  State
 _   *                *          ftp-con >  013:54:54  Listen
 _   *                *          telnet     002:07:03  Listen
 _   *                *          smtp       013:54:34  Listen
 _   *                *          domain     013:54:54  Listen
 _   *                *          domain     013:54:54  *UDP
 _   *                *          bootps     000:01:07  *UDP
 _   *                *          tftp       013:54:39  *UDP
 _   *                *          www-http   013:54:50  Listen
 _   *                *          pop3       013:54:37  Listen
 _   *                *          119        004:37:16  Listen
 _   *                *          143        004:37:25  Listen
                                                                        More...
F5=Refresh   F11=Display byte counts   F13=Sort by column
F14=Display port numbers   F22=Display entire field   F24=More keys
```

Figure 65. Work with TCP/IP Connection Status

If no application is listening to the SMTP port, try to start the SMTP server. You can do that using the Start TCP/IP Server (STRTCPSVR) command. On any AS/400 command line key the following command and press **Enter**:

```
STRTCPSVR *smtp
```

Check again if the SMTP server is listening to port 25. If it does not, display the system operator message queue (dspmsg qsysopr) and look for this error message:

```
SMTP job QTSMTPSRVR ended abnormally.
```

If you find this message (TCP2061), position the cursor on the message and press **F1** and then **F9**, you will see the job number of the job which actually failed as shown in Figure 66.

```
                          Display Message Details

Message ID . . . . . :   TCP2061       Severity . . . . . :   40
Date sent  . . . . . :   05/27/98      Time sent  . . . . . :   13:21:10
Message type . . . . :   Diagnostic
CCSID  . . . . . . . :   65535

From job . . . . . . . . . . :   QTSMTPSRVR
  User . . . . . . . . . . . :     QTCP
  Number . . . . . . . . . . :     048813

From program . . . . . . . . :   QTMSSRCP

To message queue . . . . . . :   QSYSOPR
  Library  . . . . . . . . . :     QSYS


                                                                      Bottom
Press Enter to continue.

F1=Help   F3=Exit   F12=Cancel
```

Figure 66. Display Message Details

Copy the full job information (job name, user, number) to your clipboard or write it down and press Enter three times to leave the message display. Now on the AS/400 command line, key in the command **WRKJOB** and press **F4**. In the prompt panel paste or key the full job name and *SPLF for the option parameter as shown in Figure 67 and press **Enter**.

```
                          Work with Job (WRKJOB)

Type choices, press Enter.

Job name . . . . . . . . . . .   QTSMTPSRVR    Name, *
  User . . . . . . . . . . . .     QTCP        Name
  Number . . . . . . . . . . .    048813       000000-999999
Output . . . . . . . . . . . .   *              *, *PRINT
Option . . . . . . . . . . . . > *SPLF          *SELECT, *STSA, *DFNA...


                                                                      Bottom
F3=Exit   F4=Prompt   F5=Refresh   F10=Additional parameters   F12=Cancel
F13=How to use this display        F24=More keys
```

Figure 67. Work with Job (WRKJOB)

You will see the job's spool files, use option **5** (= Display) with the file QPJOBLOG and search for any error messages. If you find the message ID TCP2074, it clearly indicates the system's host name is not found on the name server or in the local host table, but you may find also different causes.

Change the Distribution Attributes

On all AS/400 systems where OfficeVision/400 will be used to send mail to Lotus Domino for AS/400 users, you should use the *Change Distribution Attributes* (CHGDSTA) command and specify to keep all recipients' addresses. Type the following command in any AS/400 command line on *each AS/400 system* in your network where OfficeVision/400 is used to send note to Domino users:

```
CHGDSTA KEEPRCP(*ALL)
```

Verify the QSNADS Subsystem Was Started

The subsystem QSNADS needs to be active to allow SNADS based mail applications, like OfficeVision or object distribution services to receive mail. On an AS/400 system with OfficeVision installed and being used, QSNADS would be started at every system start and always be active. However, when trying to set up mail in a test environment, it might be easily forgotten and the cause of unnecessary problem determination.

Therefore it is a good idea to check that QSNADS is active. To do so you can use the *Work with Subsystems* (WRKSBS) command. Key the following command in any AS/400 command line:

```
WRKSBS
```

and press **Enter.** You will see all *active* subsystems on your system. Note, there may be more and different subsystems on your system than those shown in Figure 68. The QSNADS subsystem is shown in bold.

```
                          Work with Subsystems
                                                          System:   SYSTEM01
Type options, press Enter.
  4=End subsystem   5=Display subsystem description
  8=Work with subsystem jobs

                    Total     -----------Subsystem Pools------------
Opt  Subsystem   Storage (K)   1   2   3   4   5   6   7   8   9  10
 _   DOMINO08              0    2
 _   QBATCH                0    2
 _   QCMN                  0    2
 _   QCTL                  0    2
 _   QINTER                0    2   4
 _   QSERVER               0    2
 _   QSNADS                0    2
 _   QSPL                  0    2   3
 _   QSYSWRK               0    2

                                                                      Bottom
Parameters or command
===> ____________________________________________________________________________
F3=Exit   F5=Refresh   F11=Display system data   F12=Cancel
F14=Work with svstem status
```

Figure 68. Work with Subsystems (WRKSBS)

If the QSNADS is not active, you can start it by entering the following command on any AS/400 command line:

```
STRSBS  QSNADS
```

Set Up a Domino for AS/400 Server with the SMTP/MIME MTA

At this point we assume you already installed the Domino for AS/400 product as described in Chapter 2. The SMTP/MIME MTA is an integrated part of the server software, that is it will be installed automatically with the base part of Domino for AS/400. However, when you set up a server you need to specify if you want the MTA to be configured or not.

Note If you set up multiple partitioned servers, only one of them can have the MTA started.

To set up a server and enable the mail integration, you need to specify *SMTPMTA (or *ALL) with the *Internet mail packages* (MAIL) parameter of the *Configure Domino Server* (CFGDOMSVR) command.

If you use Operations Navigator to configure the server, you have to select one of the following:

- *Internet Mail Packages* in form 3 (as shown in Figure 69), if you selected *Quick and Easy Setup* in form 2.

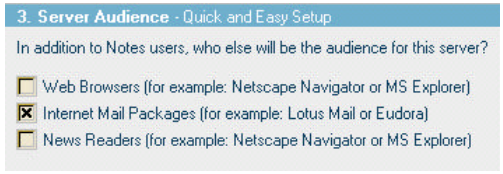

3. Server Audience - Quick and Easy Setup
In addition to Notes users, who else will be the audience for this server?
Web Browsers (for example: Netscape Navigator or MS Explorer)
Internet Mail Packages (for example: Lotus Mail or Eudora)
News Readers (for example: Netscape Navigator or MS Explorer)

Figure 69. Server Audience - Quick and Easy Setup

- Option SMTP MTA of the *Internet Mail Packages* in form 3 (as shown in Figure 70), if you selected *Advanced Setup* in form 2.

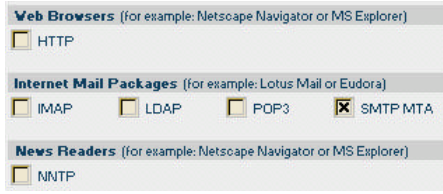


Figure 70. Server Audience - Advanced Setup

If you already configured a server without specifying this parameter, you can reconfigure the server as described in Chapter 2.

When you run the CFGDOMSVR command or create a server using Operations Navigator and select *SMTPMTA, some additional configuration is done for you under the covers.

Compared to other server platforms for Domino, the AS/400 implementation of the Lotus Domino SMTP/MIME MTA simplifies the setup process by automatically creating and configuring the required documents in the Public Address Book (PAB). The following documents describing MTA configuration parameters, are automatically created during configuration of the Domino for AS/400 server:

- Global Domain document
- Foreign Domain document
- Connection document

In addition, the server document is also updated and information added to the following:

- Basics section
- Internet Message Transfer Agent (SMTP MTA) section

The following paragraphs describe in detail what kind of information is configured in those documents.

Caution Once you have set up a Domino for AS/400 server with the MTA configured, OS/400 SMTP support will **forward all incoming SMTP mail to Domino** (even if the server is not active) if both of the following are true:

- The SMTP domain (the name on the right of the @ sign) of the incoming mail can be resolved to an IP address configured to an AS/400 interface.
- The SMTP mail box name (the name on the left of the @ sign) is not found as an alias in the SMTP names table of AS/400 system distribution directory (SDD) pointing to a local OV/400 or POP3 user.

If you do not want all incoming mail to be forwarded to Domino, you can create a data area **DOMINOSMTP** in library **QUSRNOTES**. This will change the function of the SMTP MTA snap-ins in the AnyMail/400 Mail Server Framework so that they will only route SMTP addressed mail to Domino when the SMTP address is configured in the SDD and has a “Notes Domino” message service level configured in the SDD entry found. To create this data area, enter the following command in any AS/400 command line:

```
CRTDTAARA QUSRNOTES/DOMINOSMTP TYPE(*CHAR) LEN(1)
        TEXT('Prevents forwarding unknown local mail to MTA')
```

Note In this case, you *must* add a directory for each Notes user who should be able to receive OV/400 or SMTP mail. The easiest way to do so is to use Domino for AS/400 Directory Synchronization.

If you want to return to the original behavior, you have to delete the data area by entering this command:

```
DLTDTAARA DTAARA(QUSRNOTES/DOMINOSMTP)
```

Open and Save the MTA Configuration Documents at Least Once

For internal reasons, you should open the global domain and the server document at least once for edit and then save (without changing anything) using a Notes client before starting the SMTP/MIME MTA to ensure all values in those documents are actually used by the MTA. It is also a good idea to verify and understand the settings in the other documents created by the *Configure Domino Server* (CFGDOMSVR) command for you.

Provided the OS/400 TCP/IP and SMTP configuration was done correctly, no manual changes are needed to be able to exchange mail between the Domino server and OS/400 based mail (for example OfficeVision/400). Depending on your network environment, there may be reasons to change some of the settings of the MTA configuration, for example:

- The MTA should accept incoming mail for more than one SMTP domain
- Outgoing mail should be restricted to specific SMTP domains
- You want the Notes domain name to appear on the right side of the @ sign

The Global Domain Document

The *Global Domain document* is shown in Figure 71 with the name set to MTAGlobal. The Global Domain name does not appear outside Domino. It is only used to link from the server document to the Global Domain document.

The *Internet domain suffix* in the Global Domain document is set based on the AS/400 TCP/IP configuration values for local host and local domain, that is the fully qualified host name for the AS/400 system. According to our example this would be:

```
system01.domland.acme.com
```

Caution If the contents of the field *Internet domain suffix* do not match exactly the local host and domain as defined with option **12** of the *Configure TCP/IP* (CFGTCP) menu, then mail will be "bounced" back and forth between AnyMail and Domino many times till a maximum hop count is reached and the mail will never reach the recipient. If OS/400 SMTP support accepts mail for more than one SMTP domain (see "Define the TCP/IP Host and Domain Name for the AS/400" on page 163), you have to add all valid SMTP domain names here, unless you prevent mail forwarding to Domino by creating data area DOMINOSMTP in library QUSRNOTES.

The MTA will accept inbound SMTP mail for all the Internet domain suffixes listed in the *Internet domain suffix* field. For outbound SMTP mail, the MTA uses the entry in this field as the right side of the return address.

For example, if the *Internet domain suffix* field contains the string system01.domland.acme.com, the MTA would generate the sender's SMTP address for Notes user Wilfried Blankertz/Acme to be:

`Wilfried_Blankertz@system01.domland.acme.com`

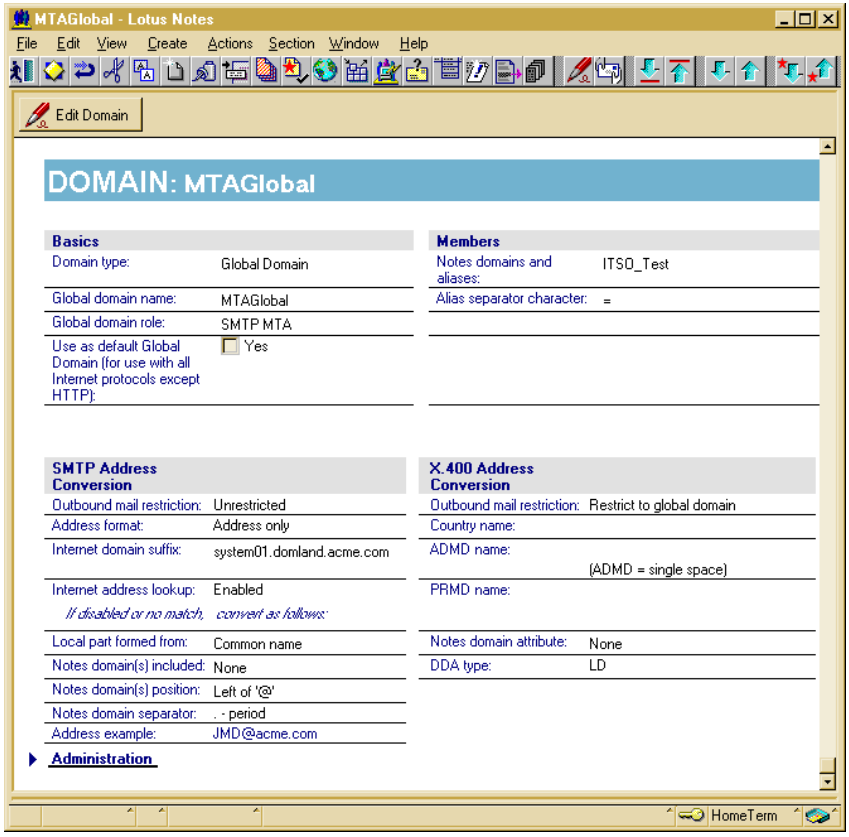

MTAGlobal - Lotus Notes
File Edit View Create Actions Section Window Help
Edit Domain
DOMAIN: MTAGlobal
Basics
Domain type: Global Domain
Global domain name: MTAGlobal
Global domain role: SMTP MTA
Use as default Global Domain (for use with all Internet protocols except HTTP): Yes
Members
Notes domains and aliases: ITSO_Test
Alias separator character: =
SMTP Address Conversion
Outbound mail restriction: Unrestricted
Address format: Address only
Internet domain suffix: system01.domland.acme.com
Internet address lookup: Enabled
If disabled or no match, convert as follows:
Local part formed from: Common name
Notes domain(s) included: None
Notes domain(s) position: Left of '@'
Notes domain separator: . - period
Address example: JMD@acme.com
X.400 Address Conversion
Outbound mail restriction: Restrict to global domain
Country name:
ADMD name:
(ADMD = single space)
PRMD name:
Notes domain attribute: None
DDA type: LD
Administration
HomeTerm

Figure 71. Global Domain Document

All other fields in the Global Domain document will contain the default entries. For more details, see the topic "*Details: Creating a Global Domain document*" in the *Domino Administration Help* database (hlpadmn.nsf) or the book *Extending the Domino System.*

The Foreign Domain Document

The foreign domain document is shown in Figure 72. The field named *Should be routed to: Domain name:* is set to *TheInternet* (as one word). This field is used to link to the SMTP connection document. The default content for the field *Internet Domain* is *.*. This means all outgoing mail addresses containing at least one

period (.) to the right of the @ sign are considered as Internet addresses and will be routed to the MTA.

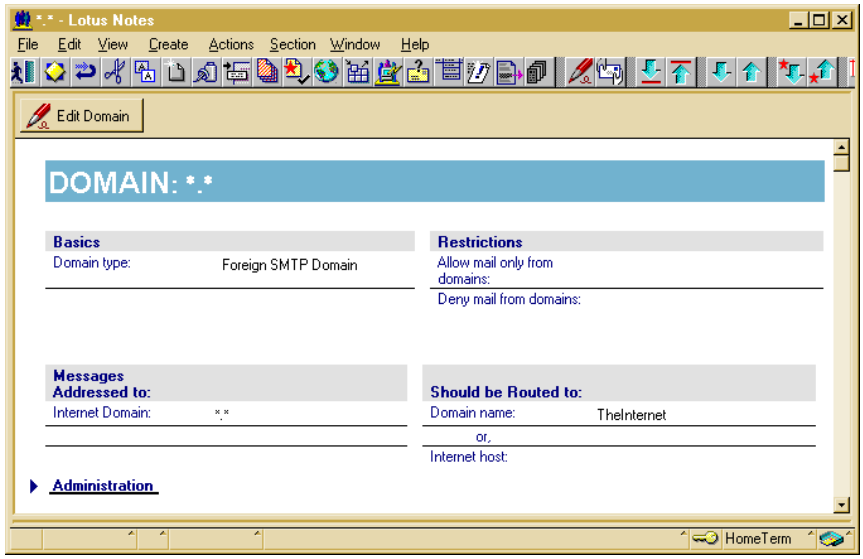


Figure 72. Foreign Domain Document

The SMTP Connection Document

The SMTP Connection Document is shown in Figure 73. The name of the *Source server* is set to the name of your Domino for AS/400 server. The default is kept for all other fields. You may change the contents of other fields, notice, however, that the following fields are ignored by the SMTP/MIME MTA for AS/400:

- Connect via
- Destination domain
- Relay host

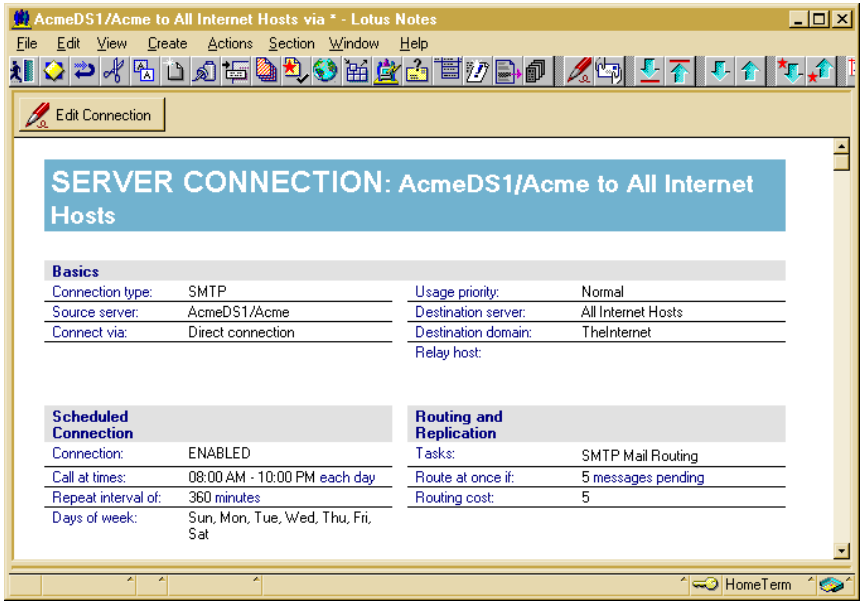

AcmeDS1/Acme to All Internet Hosts via * - Lotus Notes
File Edit View Create Actions Section Window Help
Edit Connection
SERVER CONNECTION: AcmeDS1/Acme to All Internet Hosts
Basics
Connection type: SMTP
Source server: AcmeDS1/Acme
Connect via: Direct connection
Usage priority: Normal
Destination server: All Internet Hosts
Destination domain: TheInternet
Relay host:
Scheduled Connection
Connection: ENABLED
Call at times: 08:00 AM - 10:00 PM each day
Repeat interval of: 360 minutes
Days of week: Sun, Mon, Tue, Wed, Thu, Fri, Sat
Routing and Replication
Tasks: SMTP Mail Routing
Route at once if: 5 messages pending
Routing cost: 5
HomeTerm

Figure 73. The SMTP Connection Document

The Server Document

In addition to adding new documents to the Public Address Book as described above, the contents of the *Basics* section and the *Internet Message Transfer Agent (SMTP MTA)* section (Figure 75) in the server document are modified with the configuration parameters for the SMTP/MIME MTA.

The Basics section of the Server Document

You can see the *Basics* section of the server document on top of the form when you open the document. The configuration porcess for the SMTP MTA adds the task name "SMTP Mail Routing" to the field *Routing tasks* as shown in Figure 74.

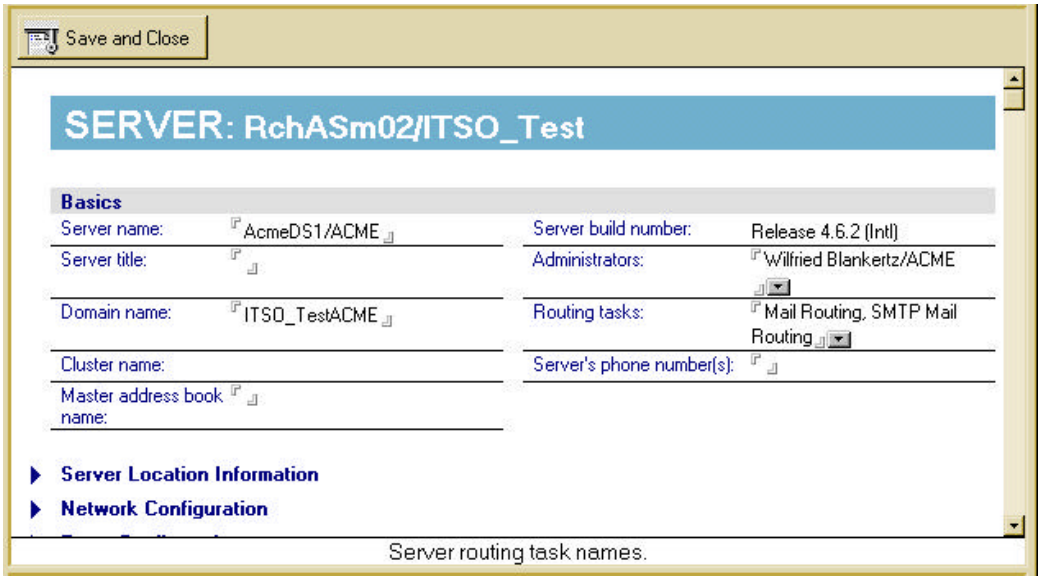


Figure 74. Basic Section of the Server Document

The Internet Message Transfer Agent (SMTP MTA) Section

Tip If you see the message "Feature not installed." under the title *Internet Message Transfer Agent (SMTP MTA)*, the public address book is based on a template before Domino 4.6. This can happen easily if you added the Domino for AS/400 server to an existing Domain and the Public Address Book of that domain was not yet refreshed. See "Server Document Shows 'Feature not installed'" on page 204.

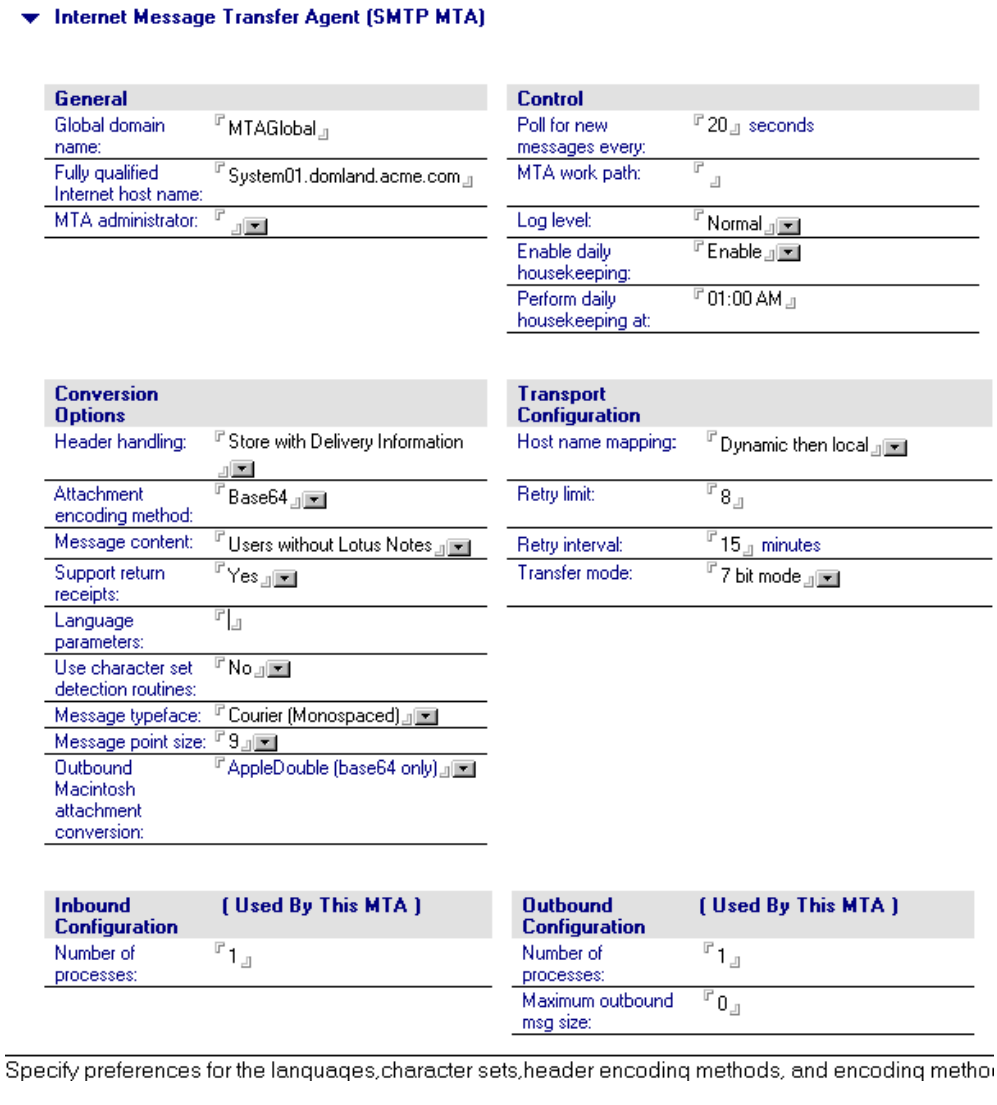


Figure 75. Internet Message Transfer Agent (SMTP MTA) Section

The field *Global domain name* contains the name MTAGLOBAL, thus linking to the global domain document.

The *Fully qualified Internet host name* is set based on the AS/400 domain name on the local host and domain as defined with option **12** of the *Configure TCP/IP* (CFGTCP) menu.

Language Dependent Character Set Conversions
If the Notes clients are using a character set different from US-ASCII, you should modify the field *Language parameters* in the *Internet Message Transfer Agent (SMTP MTA)* section of the server document. Depending on the language, enter the following value into the *Language parameters* field:

LT for the Latin (ISO-8859-1 through ISO-8859-9) this includes the character sets for the following languages:

- Western Europe
- Central Europe
- Baltic Rim
- Cyrillic
- Greek
- Hebrew
- Turkish

JP Japanese (ISO-2022-JP, EUC-JP, ShiftJIS)

CN Chinese (GB 2312)

KR Korean (KSC5601/EUC-KR, ISO-2022-KR)

For more information refer to section “Language parameters” in chapter 4 of the book *Extending the Domino System* or the document “Details: Editing the Server document for the SMTP MTA” in the *Domino Administration Help* database (`doc\HELPADMN.NSF`).

Restart the AnyMail Mail Server Framework

After you set up a Domino server that includes the SMTP/MIME MTA, you must reset the AnyMail function one time by stopping it and then restarting it.

1. You use the *End Mail Server Framework* (ENDMSF) command to stop the AnyMail function. Enter the following AS/400 command on an AS/400 command line:

   ```
   ENDMSF
   ```

2. You use the *Start Mail Server Framework* (STRMSF) command to start the AnyMail function again. Enter the following AS/400 command:

   ```
   STRMSF
   ```

3. It is a good idea to verify that the AnyMail function was actually started. Enter the following command to display a list of jobs:

   ```
   WRKUSRJOB qmsf
   ```

   Verify that there is at least one job listed.

Start the MTA on the Domino Server

There are two ways of starting the SMTP/MIME MTA on the AS/400 system after it is installed and configured:

- Manually - from a Domino console
- Automatically - as an add-in Server task

Starting the MTA Manually

You can start the MTA by issuing the following command from either the *Work with Domino Console* command line or a remote Domino console on a Notes client:

```
load smtptmta
```

After pressing **Enter** and - after a couple of seconds - pressing the **F5** key, you should see the completion message as shown in Figure 76.

```
                        Work with Domino Console

Previous subcommands and messages:
  05/29/98 07:04:05 PM  Opened session for Wilfried Blankertz/Rochester/IBM
  (Build 147)

  > load smtpmta

  05/29/98 07:06:06 PM  SMTPMTA: Starting
  05/29/98 07:06:35 PM  SMTPMTA: MTA startup completed
Enter a Domino subcommand.
===> ____________________________________________________________________________
_____________________________________________________________________________
F3=Exit   F5=Refresh   F6=Print   F9=Retrieve
F17=Top   F18=Bottom   F21=Command line
```

Figure 76. MTA Startup Completed

Starting the MTA Automatically with the Server

If the word SMTPMTA was added to the "ServerTasks" statement in the NOTES.INI file, the MTA will be started every time you start the Domino server. For example:

```
ServerTasks=Replica,Router,Update,Stats,AMgr,Adminp,Sched,Event,SMTPMTA,QNNINADD
```

Verify that the SMTP/MIME MTA was Completely Started

There are several ways of determining that *all* of the necessary MTA tasks are active:

- Using the Domino console command **`show tasks`** (short form: **`sh ta`**). You see the tasks listed as shown in Figure 77.
- Using CL commands you can see the same tasks as AS/400 jobs, since they have the same name as the Domino tasks listed above.

Note The OSESHLRn and the ISESHLRn tasks will only appear when mail is being sent or received.

```
                          Work with Domino Console

Previous subcommands and messages:
  Transactions:            140
  Shared mail:             Not enabled
  Pending mail:  0         Dead mail:  0

        Task                  Description

    Database Server       Perform console commands
    Database Server       Listen for connect requests on TCPIP
    Database Server       Server for Wilfried Blankertz/Rochester/IBM on TCPIP
    Database Server       Idle task
    Database Server       Idle task
    SMTPMTA drt           Idle
    SMTPMTA isesctl       Idle
    SMTPMTA imsgcnv       Idle
    SMTPMTA osesctl       Idle
Enter a Domino subcommand.
===> ____________________________________________________________________________
____________________________________________________________________________
F3=Exit    F5=Refresh    F6=Print    F9=Retrieve
F17=Top    F18=Bottom    F21=Command line
```

Figure 77. Show the MTA Tasks on the Domino Server

The easiest way is probably using the *Work with Domino Servers* (WRKDOMSVR) command. Key the following command in any AS/400 command line and press **Enter**:

```
WRKDOMSVR
```

You will see a list of all servers defined at your system. Enter a **9** (*Work Domino jobs*) next to the server having the MTA installed and press **Enter**. You will see a panel like the one shown in Figure 78. When the AS/400 SMTP/MIME MTA is operational, the following tasks must all be active:

- DRT
- ISESCTL
- IMSGCNV
- OSESCTL
- OMSGCNV
- SMTPMTA

```
                              Work with Active Jobs                    SYSTEM01
                                                                 05/31/98  13:08:51
CPU %:   19.7     Elapsed time:   00:00:08     Active jobs:   191

Type options, press Enter.
  2=Change   3=Hold   4=End   5=Work with   6=Release   7=Display message
  8=Work with spooled files   13=Disconnect ...

Opt  Subsystem/Job  User        Type  CPU %  Function        Status
__   DOMINO18       QSYS        SBS      .0                 DEQW
__     ADMINP       QNOTES      BCI      .1                 SELW
__     AMGR         QNOTES      BCI      .0                 TIMW
__     DRT          QNOTES      BCI      .1                 DEQW
__     EVENT        QNOTES      BCI      .5                 SELW
__     IMSGCNV      QNOTES      BCI      .1                 DEQW
__     ISESCTL      QNOTES      BCI      .2                 DEQW
__     OMSGCNV      QNOTES      BCI      .2                 DEQW
__     OSESCTL      QNOTES      BCI      .1                 TIMW
                                                                    More...
Parameters or command
===> ____________________________________________________________________
F3=Exit   F4=Prompt        F5=Refresh   F10=Restart statistics
F11=Display elapsed data   F12=Cancel   F14=Include   F24=More keys
```

Figure 78. Work with Domino Jobs

Verify that all of the tasks listed above appear. You may have to press the PgDn key to see all of the active jobs, for example the job SMTPMTA is not shown in Figure 78. The MTA is not full operational, if one of the jobs is missing. See “Additional Information for Troubleshooting” on page 200 for more information.

Sending Mail Between Unlike Mail Applications

Now that you have successfully started the SMTP/MIME MTA on your Domino for AS/400 server and verified that OS/400 SMTP support is active (see Figure 65 on page 168), you can try to send mail in all required directions, that is to and from all mail platforms.

Tip While testing, you can very easily confuse yourself by not understanding exactly *from* which test user you want to send mail *to*. Make sure to set up a well defined test scenario with completely distinct names. Enroll those users only where needed. For example:

- Do not enroll the same name in Lotus Notes *and* in OfficeVision/400 (this never works!).
- Do not create an AS/400 user profile for a Notes user (this works but is confusing in a test environment).
- Try to summarize in a table what the important configuration parameters are and what users you defined for testing and the values configured.

Bad Example: "I want to send mail from *my* Notes ID to *my* OfficeVision ID" basically means trying something (almost) impossible and asking for confusion.

The important parameters of the examples we have given so far are summarized in the following tables.

OS/400 TCP/IP Configuration

AS/400 System Name[8]	SYSTEM01
AS/400 Host Names	SYSTEM01
TCP/IP Domain	domland.acme.com

Domino Configuration

Server Name	AcmeDS1
Notes Organization	OrgA
Notes Domain	OrgA

We set up a Notes user with Domino for AS/400 as his home mail server with the following parameters:

Lotus Notes User

Common Name	Hans Neugebauer
Last Name	Neugebauer
First Name	Hans
Short Name	hneugeba
Full Name	Hans Neugebauer/OrgA

We set up an OfficeVison/400 user with the following parameters:

OfficeVision/400 User

User profile	EBENDER
User ID	EBENDER
Address	SYSTEM01

The following sections describe the addressing considerations you need to understand in order to successfully send mail between these two different worlds of electronic mail.

[8] The AS/400 system name is set through the *Change Network Attributes* (CHGNETA) command. It does not have to be the same as the host name, but it is certainly a good idea. The AS/400 systems name shows on the upper right corner of many AS/400 displays.

How Can We Reach You - What Is Your Internet Mail Address?

Before trying to send mail, make sure to understand exactly from each user's (that is from each mail application's) point of view, what is the correct address to reach the user and based on which configuration parameters the address is formed.

Each mail system, like Lotus Notes or OfficeVision for AS/400, has its own syntax and naming conventions to address mail users. Since we are using the SMTP format for the mail between these unlike systems, we first need to know each user's SMTP address, that is, the Internet Mail address[9].

On the Right of the @ Sign: The SMTP Domain Name

Any SMTP mail address always has the form *username@SMTPdomain*. The part on the left of the @ sign describes the user's name, or better: the user's mail box name and is defined by the mail application being used.

The *SMTP domain*[10] name on the right side of the @ sign must be a valid host name of the AS/400, that is it must be possible to resolve this name to an IP address assigned to a network interface on your AS/400 system. Note that the same SMTP domain name is used for *all* mail applications running on your AS/400 system (Domino, OV/400, POP3 server), since they all use OS/400 SMTP support.

However, you can define more than one SMTP domain name, that your system will accept incoming mail for (see "A Single AS/400 Known by Multiple SMTP Domain Names" on page 166). Likewise the MTA can accept mail for more than one SMTP domain. This requires a modification in the Global Domain document (see "The Global Domain Document" on page 173). In combination with assigning a specific SMTP address for individual users, this allows you to have users with different SMTP domains (see "Manually Assigning an SMTP User Name for a Notes User" on page 185).

Automatically Assigning an SMTP User Name for a Notes User

For the user part of the SMTP address, you have the choice of automatically assigning a name based on the current enrollment or to define an arbitrary name on a user-by-user basis. Obviously the method is different for Notes users and for users of OfficeVision for AS/400. We explain both concepts in the following topics.

For receiving SMTP mail for a Notes user, actually any part of the user's name as defined in the person document can be used as an SMTP user name (mail box), **as long as this is a unique name**. For example, to reach Hans Neugebauer, you could use any of the following on the left side of the @ sign:

---

[9] In many places in the documentation, the SMTP address is called Internet mail address. We prefer to call it SMTP address, because it is not only used to exchange mail via the Internet.

[10] The term SMTP domain is not at all related to a Notes or Domino domain, nor is it the same as the TCP/IP domain, although the TCP/IP domain can be a part of the SMTP domain name.

1. Hans_Neugebauer@system01.domland.acme.com
2. Neugebauer@system01.domland.acme.com
3. Hans@system01.domland.acme.com
4. hneugeba@system01.domland.acme.com
5. Hans_Neugebauer/Acme@system01.domland.acme.com

However, if tomorrow a new employee with Hans as his first name were added to the Public Address Book, any incoming mail using the address given in line 3 would be returned as non deliverable.

Now, if all those addresses listed above will be accepted, why is there a parameter (the field *Local part formed from* - see Figure 71 on page 174) in the Global Domain Document to specify which part of the name is to be used? The answer is, this configuration parameter defines what will be shown in the *return address* of any note sent by this user. This allows you not to enforce, but to encourage people sending mail to the Notes users to use a certain form of address.

The default for parameter *Local part formed from* after configuring the MTA on Domino for AS/400[11] is the "common name," which is the first and last name separated by an underscore (_) sign, that is list item **1** in our example above.

Manually Assigning an SMTP User Name for a Notes User

Now, with Release 4.6 of the Domino server, in addition to assigning an SMTP user name automatically based on the contents of the name fields in the person document, you can assign arbitrary value as the user's complete Internet mail address. For example:

- Jean@Dept0416.acme.com

The way to do so is to enter the full SMTP address, that is including the @ sign, into the field *"short name"* in **addition** to the existing short name.

While you can assign a totally arbitrary SMTP user ID and/or SMTP domain to some (or all) users, you have to make sure that OS/400 SMTP, as well as the Domino for AS/400 SMTP MTA, accepts incoming mail for that domain. For OS/400 SMTP, this means you have to define the SMTP domain name Dept0416.acme.com as an alias[12] host name (see A Single AS/400 Known by Multiple SMTP Domain Names on page 166); for the MTA. You also have to modify the global domain document and add this name to the field *Internet domain suffix* (see page 173).

Caution Do *not* enter the user's SMTP address into the field "Forwarding address." This field should only be used if the user's mail should be forwarded to another system. Specifying a local user's SMTP address

---

[11] Note, if you create a global domain document manually, default would be "full name," that is including the Domino organization name, as shown in line 5 of our example.

[12] The term "alias" should not be confused with the personal or system SMTP alias tables. Here we refer to multiple host names assigned to a single IP address.

here, would result in sending the mail back and forth between OS/400 SMTP support and Domino until the hop count exceeds its limit. The Help text[13] for the field "Forwarding address" (as shown in Figure 79) may be somewhat misleading:

Erika Bender/wshop - Lotus Notes
File Edit View Create Actions Window Help
Edit Person
Last name: Bender
Mail server: mailtest
User name: Erika Bender/wshop
Erika Bender
Mail file: mail\ebender
Short name and/or ebender
Forwarding address:
Internet addr
Enter the user's complete mail address route, including the domain name(s); for example, John Smith@Acme@External. This address ensures proper mail routing between domains, especially if the user receives mail through a gateway server.
Internet pass
Work
Title:
Company:
City:
You have new mail.
HomeTerm

Figure 79. Context Help for Forwarding Address

Assigning an SMTP User Name for an OfficeVision/400 User

Users of OfficeVision for AS/400 have mail addresses consisting of two fields, each having one to eight alphabetical characters or numbers and no spaces or special signs. The fields are known as **User ID** and **Address**. In many cases AS/400 customers choose to use the same name for the User ID as for the AS/400 user profile, but this is not necessarily the case. In many cases the Address is chosen to be same as the AS/400 system name. The pair User ID / Address can be thought of as the key for the user's entry in the System Distribution Directory (SDD).

If the OfficeVision/400 user wants to receive SMTP-based mail (which includes mail from users of Domino for AS/400), an address conforming to the SMTP standards must be used instead. That is, an SMTP alias is assigned to the user's SDD entry.

The same is true for a user of a POP3 client connecting to the OS/400 POP3 server. However, a POP3 user needs an SMTP address in any case, while OfficeVision users can send and receive among themselves without ever having an SMTP address assigned.

There are two ways to assign an SMTP alias to a directory entry:

- Automatically based on the user's User ID/Address and the AS/400 system's local host name.

[13] To see the help text, place the mouse pointer on the title of the field and click and hold the left mouse button. However, not all fields in the Public Address Book have field level Help text.

- Manually using the *Work with Names for SMTP* (WRKNAMSMTP) command or the *Work with Directory Entries* (WRKDIRE) command.

Both methods are described in the following topics.

Default SMTP Address for OS/400-Based Mail Users
An SMTP address will be automatically generated for each local directory entry using a combination of user ID, Address and the AS/400's local host name. There are two possible forms:

- UserID?Address@SMTP domain
- UserID@SMTP domain

The second version is only possible if the user's address is the same as the AS/400 system name[14]. You can also change the SMTP configuration on your AS/400 system to use a character other than the question mark (?) to delimit user ID and address. To do so use the *Change SMTP Attributes* (CHGSMTPA) command to set the delimiter to one of the following characters:

```
? = . & $ # / + _ - * "
```

The SMTP domain must be the AS/400 system's local host name as defined in the *Change TCP/IP Domain* (CHGTCPDMN) command or option **12** of the *Configure TCP/IP* (CFGTCP) menu.

Assigning an SMTP Alias Manually
You can also assign an arbitrary SMTP address to an AS/400 mail user in addition to the automatically assigned one. The function to do so is called *Change name for SMTP*. This function allows you to assign a full SMTP address (that is SMTP user ID and SMTP domain) to each entry in the SDD.

[14] You can use the *Display Network Attributes* (DSPNETA) command to find out your AS/400 system name.

Internally, there are two different implementations possible:

- All the SMTP addresses are stored in a database file separate from the SDD. This is the implementation on every AS/400 system, unless you *convert* the SMTP names. For this default implementation, the following facts apply:
  - Each SMTP user ID can only be up to 24 characters long.
  - There are system-wide SMTP names ("system alias table") as well as personal entries (only to be used by a single AS/400 user).
  - The SMTP names can be maintained by one of the following:
    - The *Work with Names for SMTP* (WRKNAMSMTP) command
    - The **F19**[15] key (= Change name for SMTP) when using option **1** or **2** of the *Work with Directory Entries* menu.
    - You *cannot* enter or change an SMTP name with the *Add Directory Entry* (ADDDIRE) or *Change Directory Entry* (CHGDIRE) commands.
- Optionally you may convert your SMTP alias table (using the *Convert Names SMTP* (CVTNAMSMTP) command - see "Directory Conversion" on page 196 for more information). After doing so, the SMTP names are stored in "user defined fields," directly with each entry in the System distribution directory. In this case, the following facts are true:
  - The SMTP user ID can be up to 64 characters long.
  - The personal alias table *cannot* be used anymore.
  - The SMTP names can be maintained by one of the following:
    - The **F19** key (= Change name for SMTP) when using option **1** or **2** of the *Work with Directory Entries* menu.
    - The *Add Directory Entry* (ADDDIRE) or *Change Directory Entry* (CHGDIRE) commands can be used to enter or change the user defined fields containing the SMTP address.
    - The *Work with Names for SMTP* (WRKNAMSMTP) command cannot be used anymore.

In any case, the SMTP alias table allows you to assign a full SMTP address, consisting of SMTP user ID and SMTP domain to each SDD entry representing a local mail user.

Caution If you use an SMTP domain name different from the AS/400 system's local host name, you have to make sure OS/400 SMTP support accepts incoming mail for that SMTP domain. See "A Single AS/400 Known by Multiple SMTP Domain Names" on page 166 for more information.

---

[15] On most keyboards this is **Shift** and **F7**. Difficult to remember? Tip of a colleague: 7 PM equals 19:00 in 24 hour time format.

For example, assuming you have converted your SMTP names, you would assign a more meaningful SMTP address to the person with user profile EBENDER by using the *Change Directory Entry* (CHGDIRE) command:

```
CHGDIRE USRID(EBENDER SYSTEM01)
          USRDFNFLD((SMTPAUSRID SMTP 'Erika_Bender')
                    (SMTPDMN SMTP 'system01.acme.com'))
```

If you use the option **2** and then **F19** of the *Work with Directory Entries* (WRKDIRE) command it is easier to change the address since you don't have to remember the names of the user defined fields (SMTPAUSRID and SMTPDMN), however the example above has to be used if you want to write a CL program to assign the address. So we used the example above for reference.

Sending Mail Across the Border

Now that you know what the SMTP addresses are to reach a user of Domino for AS/400 (or any other Notes user in the same or connected Notes domain), as well as those for the users of OS/400-based mail (POP3 or OfficeVision for AS/400), we can look at the reverse situation: how you can *send* mail from each of the two mail applications to the other. That is how you can specify a *foreign* mail address. Again, we look first at the Notes users, when sending mail to OV/400 users, and then we describe the opposite direction.

Specifying SMTP Addresses When Sending Mail From Notes

When a Notes user sends mail to another Notes user the address to be specified has the following form:

```
Common Name/Organizational Unit/Organization@Notes Domain
```

Organization and Organizational Unit can be omitted, as long the name of the recipient is unique within the public address book. Likewise, you can also use only the short name, first or last name instead of the full common name, provided that name is unique. The domain name (which may or may not be identical to the organization) can also be omitted if the recipient is in the same Notes domain or an entry for that user exists in the public or cascaded address book. Each name part can contain spaces.

Now, an SMTP address has the general form:

```
User_Id@SMTPDomain
```

If you want to send mail to an SMTP address, Notes must be able to identify the address as a "foreign" mail address. The rule for this is:

- The address must contain an @ sign **and** on the right side of the @ sign there must be at least one period (.).

For example the address **Erika_Bender@SYSTEM01** would be a valid address in the sense that it would be accepted by OS/400 SMTP support (because **SYSTEM01** is the AS/400 system's local TCP/IP host name).

However, the Domino mail router would search for a Notes domain called **SYSTEM01** rather than forwarding the mail to the SMTP MTA. Therefore one of the period delimited SMTP addresses needs to be specified:

```
Erika_Bender@SYSTEM01.domland.acme.com
EBENDER@SYSTEM01.domland.acme.com
EBENDER?SYSTEM01@SYSTEM01.domland.acme.com
```

There are several ways to specify a mail recipient's address in Lotus Notes:

- Enter the mail address manually
- Use a stored address for recipients on foreign mailing systems

Entering the Mail Address Manually

When sending mail from a Notes client you can always enter an SMTP (Internet) mail address instead or in addition to Notes mail addresses into the To:, cc:, or bcc: fields as shown in Figure 80.

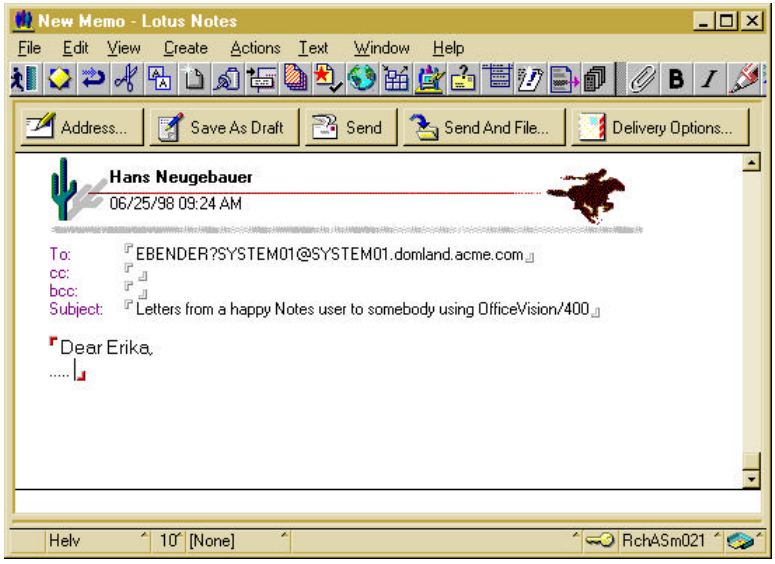

New Memo - Lotus Notes
File Edit View Create Actions Text Window Help
Address... Save As Draft Send Send And File... Delivery Options...
Hans Neugebauer
06/25/98 09:24 AM
To: EBENDER?SYSTEM01@SYSTEM01.domland.acme.com
cc:
bcc:
Subject: Letters from a happy Notes user to somebody using OfficeVision/400
Dear Erika,
Helv 10 [None] RchASm021

Figure 80. Entering the Mail Address Manually

Using a Stored Address for Recipients on Foreign Mail Systems

Keying in such a long address is not a problem when testing a new mail connection, but is certainly cumbersome and error prone if users have to do this daily.

To make it easier for the senders of SMTP mail (or mail to other Notes domains), you may store the recipients address in either the domain's public address book or in each user's personal address book.

Storing Foreign Mail Users' Addresses in the Public Address Book
If many Notes users often send mail to a defined group of mail users not using Notes (or not being in the same domain), you can make addressing mail much easier by creating person documents for the "foreign mail" users in the Domain's PAB.

A good example is where some people in your company use OfficeVision mail, while others use Domino for AS/400. If you want to do so, you should *not* register a Notes ID, but just add a new person document to the public address book.

Enter the real name of the person to allow the Notes user to select the mail recipient by their names, rather than mail addresses. Select "Other Internet Mail" in the field "Mail system:" and the layout of the form under the column *Mail* will change. As shown in Figure 81, the foreign user's SMTP address must be entered into field "Internet address:."

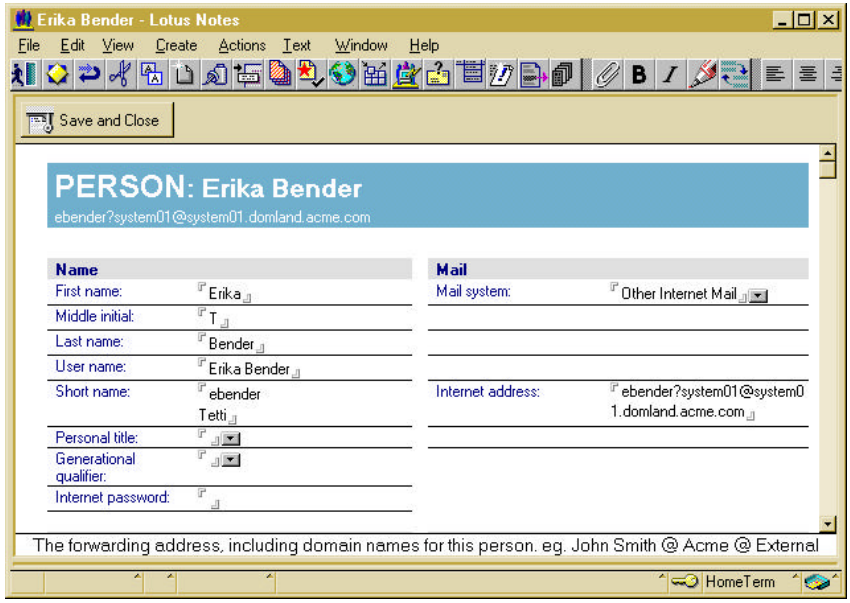


Figure 81. Person Document for Foreign Mail User

The SMTP address **must** have at least one period (.) at the right of the @ sign, even if the recipient's mail system would accept a partial SMTP domain name. For example, from the receiving system's standpoint (OS/400 SMTP support) if the AS/400 system's host name is SYSTEM01, it would accept an incoming e-mail addressed to ebender@system01; however, from the sending Domino mail router

point of view this address would be ambiguous, because it could as well be a Notes address where system01 specifies a Notes domain.

You must key in the full SMTP address for the recipient. In Figure 81 we used the example of an OfficeVision/400 user as defined on page 183. Note that you have a choice of address formats as described in "Default SMTP Address for OS/400-Based Mail Users" on page 187. We choose the format having the SDD user ID and address at the left of @ separated by a question mark (?). The reason is, that this format is most likely to be a unique address and does not require an SMTP alias to be defined in OS/400.

There must be at least one combination of the several name fields which can be used to uniquely identify this person document.

Note The person document you are creating here has a different purpose than the one being created when you register a Notes user. Here, it is just a convenient (and not mandatory!) pointer to a mail recipient who is *not* a user in this Notes domain.

The rules for defining an SMTP address are:

- For a mail recipients outside of the Notes domain, you must specify that person's mail address in field "Internet address:".
- For a Notes user to be able to receive foreign mail, you either use the automatically assigned address (see "Automatically Assigning an SMTP User Name for a Notes User" on page 184) or specify the address in field "Short name and/or Internet address:"

Make sure not to confuse the two different roles the person documents in the Public Address Book can have.

Storing foreign mail users' information into the PAB makes the most sense, if you can do that for many users at once and - since the users' information is maintained on a different system - automatically synchronize with the place where the users' information is managed.

In the case of coexistence between OS/400 based mail users and Domino for AS/400 users, this is exactly what Domino for AS/400 *Directory Synchronization* can do for you. It automatically copies the information from the AS/400 system distribution directory to a Domino Address Book - either the Public Address Book or another address book (based on the same template) which then can be combined with the Public Address Book into a master address book.

Storing Foreign Mail Users' Addresses in the Personal Address Books
If individual Notes users send mail frequently to other users who do not have a person document in the PAB, the Notes users can also store the recipient's mail addresses in the personal, local address book.

Storing a foreign mail user's address in a personal book is basically the same as storing it in the PAB, except:

- This entry is only available to a single mail sender
- In Notes 4.6, the person documents in Personal Address Books (based on the template person documents have been renamed *business cards*.

To enter a business card in your personal address book, open your local address book, usually identified by an icon showing an open book with a red cover, by double clicking the icon on your workspace. Then click on the **Add Card** button. You see the New Business Card form as shown in Figure 82.

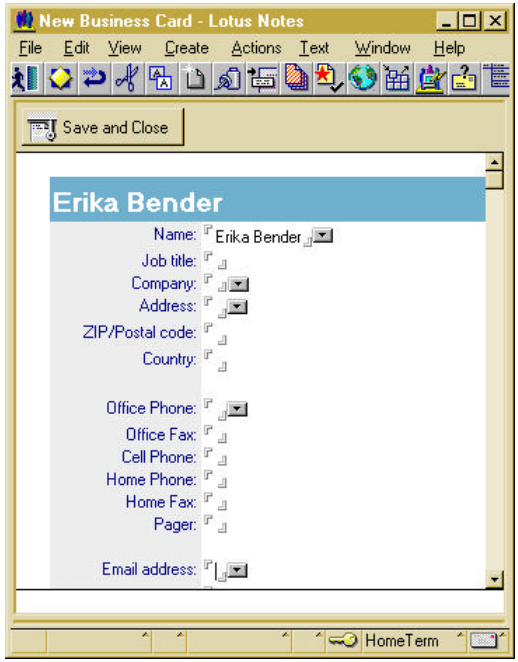


Figure 82. Enter a Person's Business Card

To get assistance entering an SMTP address, click the twisty on the right of the field and the **Mail Address Assistant** will be opened (Figure 83).

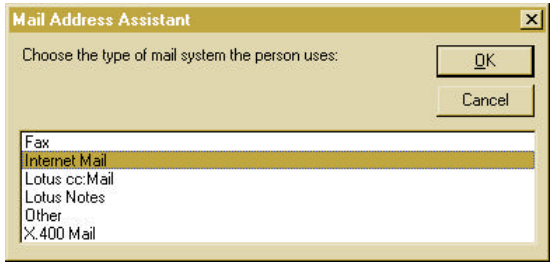


Figure 83. Mail Address Assistant

Click **Internet Mail** and then **OK**. This will open the window as shown in Figure 84.

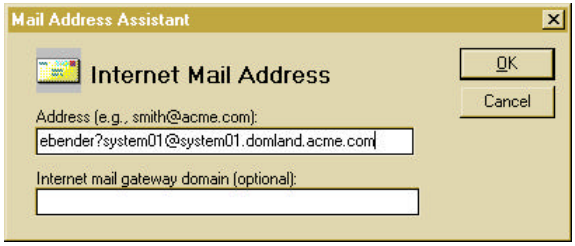


Figure 84. Enter an Internet Mail Address for a Business Card

Key in the full SMTP address for the recipient. In Figure 84 we used the example of an OfficeVision/400 user as defined on page 183. Note that you have a choice of address formats as described in "Default SMTP Address for OS/400-Based Mail Users" on page 187. We choose the format having the SDD user ID and address at the left of @ separated by a question mark (?). The reason is, that this format is most likely to be a unique address and does not require an SMTP alias to be defined in OS/400.

Note Do not enter anything in the field "Internet mail gateway domain," unless the MTA is in a different Notes domain. In that case you would enter the name of the Domino domain[16] , where the server with the MTA installed belongs (assuming you have set up the *connection documents* and *domain documents* in your Public Address Book on your server to allow mail routing between the domains).

Click **OK** to enter mail address into the business card, click **Save and Close** to save the document and then close the address book.

At this point, Notes users connected to the Domino for AS/400 server may send mail to and receive mail from Internet mail users whose mail servers have a TCP/IP connection to the AS/400 system.

However, if mail integration between OfficeVision for AS/400 and Domino for AS/400 is your main topic, you should understand how OfficeVision users can send mail to SMTP addresses (and therefore to Domino for AS/400 users).

Specifying SMTP Addresses When Sending From OfficeVision/400

When sending mail, an OfficeVision/400 user can only address recipients by specifying a pair of fields, the user ID and the address. Both fields being limited to a maximum length of eight characters, there is no way to key a SMTP address into those fields, since those are typically much longer. Furthermore - and this is the most important point - each of those "8 by 8" addresses *must* resolve to an entry in the system distribution directory.

---

[16] Note, this is neither the SMTP domain nor the TCP/IP domain.

There are several ways that an OfficeVision/400 user can send mail to an SMTP address:

- Add a directory entry for each “foreign” mail user to the SDD and assign an SMTP alias to that entry.
- Add a generic directory entry for an entire SMTP. That is, the user ID has to be *ANY. This is a very convenient way to define the addresses of many SMTP addressees at once. However, the restriction is that the left side of the address (SMTP user) can only be up to 8 alphabetic or numeric characters.
- Use “ad hoc” Internet addressing, a new function of OfficeVision for AS/400 Version 4 Release 1.

Using Ad Hoc Internet Addressing

Ad hoc Internet addressing can be used to send mail to infrequently used SMTP addresses on the Internet or Notes users not in an address book being synchronized with the AS/400 SDD.

You can use ad hoc Internet addressing to send mail to any SMTP user in your TCP/IP network or the entire Internet (if the system is connected), as well as users on Domino for AS/400 (if the SMTP/MIME MTA is active).

Obviously the disadvantage of this method is that you have to key in the full (sometimes very long) address exactly correct, rather than just selecting a name from a directory list. Also there is no kind of verification on the sending system whether the address is correct or not.

Another not so obvious disadvantage is the fact that for incoming mail from an SMTP address, the OV/400 user cannot use the Reply key to send a response. The address has to be keyed manually instead.

See chapter 7 of the book *OfficeVision for AS/400 Supplement*, SH21-0915-00 or the redbook *New E-mail Capabilities for AS/400*, SG24-4703 for more information on Internet Addressing.

Storing Foreign SMTP Addressees in AS/400 System Distribution Directory

The disadvantage of the first method (using SDD entries for SMTP addressees) is, that end users normally do not have the authority to add directory entries to the SDD. However, if the administrator is able to create and provide maintenance for those entries, this is the most flexible and most convenient method. For SMTP addresses of Domino for AS/400 users[17], Directory Synchronization can be used to create and maintain those entries.

[17] This is not restricted to users on Domino for AS/400, it also includes any users on other servers in the PAB or even a master address book covering multiple Notes domains.

If you want to add a directory entry for an SMTP user you want to send mail *to*, you do *not* need to create an AS/400 user profile to be associated with that entry[18], unless the person would use the OS/400 POP3 server (not the Domino POP3 server). That is, the entry can be a "remote" entry - although it may sound strange that a Domino for AS/400 user on the same AS/400 system is added as a "remote" SDD entry. "Remote" just means, not a user of this AS/400 system's mail support. Again, we are talking here about the (optional) task of creating an entry for the *recipient* of SMTP mail, rather than the mandatory, local entry of the sender using OV/400.

One important consideration is the fact that by default you can only store an SMTP user ID up to a length of 24 characters in the SMTP alias associated with the SDD entries. Since the Domino for AS/400 MTA uses the *common name* in the user part of the sender's SMTP address (if you accept the default), a length of 24 characters is most likely too short. We therefore recommend converting the directory to allow SMTP user IDs with a length up to 64 characters.

Directory Conversion

Shipped with the TCP/IP Utilities licensed program product on the AS/400 system, SMTP/MIME support defines its own system alias table and personal alias table objects. This is a separate object from the System Distribution Directory.

The purpose of the alias table is to assign SMTP addresses to entries for local or remote mail users in the System Distribution Directory. System alias table and system distribution directory are linked by a common User ID / Address although not every entry in the system alias table has to appear in the system distribution directory.

It is possible to convert the system distribution directory and system alias table so that they are combined into the system distribution directory. This can be thought of as a logical "join" on the User ID Address fields.

The result of the conversion is that the system distribution directory has three new user-defined fields that contain the SMTP user name (field name SMTPAUSRID), SMTP Domain (SMTPDMN) and the mail router name (SMTPRTE) that used to be configured for the system alias tables. Also as a result of the conversion, the system alias tables as well as the personal alias tables function are disabled for that AS/400 system.

The advantages of converting are:

- Longer SMTP user IDs are available (64 characters after converting, versus 24 characters before).

[18] It would not be a problem to use a local SDD entry; however, the AS/400 user profile associated with this entry **cannot** use OfficeVision for AS/400.

- All the e-mail addresses are in the same directory. There is less chance of a problem that is caused when the alias table object or system distribution directory is restored independently and some entries that should be in both tables are not in one of the saved copies that was restored.
- SMTP aliases can be shadowed to other AS/400 systems as part of the system distribution directory shadowing.
- Updating, changing, or removing an SMTP address can now be done with a program using the following CL commands:
  - *Change Directory Entry* (CHGDIRE)
  - *Add Directory Entry* (ADDDIRE)
  - *Remove Directory Entry* (RMVDIRE)

The Disadvantages of Conversion are as follows:

- SMTP *personal* aliases are not converted and cannot be used any more. This is only an issue if using OfficeVision/400 or JustMail/400.
- The *Work with Names for SMTP* (WRKNAMSMTP) command can no longer be used.
- The Conversion is **not** reversible.

Converting SMTP Names

A conversion function is available to merge SMTP Alias Table entries into the system distribution directory.

To determine if the conversion has already been performed, run the *Work with Names for SMTP* (WRKNAMSMTP) command. If you receive an error message stating the WRKNAMSMTP command is disabled, the SMTP alias tables have already been converted.

To Convert, run the *Convert Names SMTP* (CVTNAMSMTP) command to start the conversion.

To verify that the conversion completed, use the Work Name SMTP (WRKNAMSMTP) command. The message “WRKNAMSMTP command disabled.” (TCP9610) should be shown.

Adding a Directory Entry for Domino for AS/400 Mail Recipients

If you want to manually add a directory entry representing a Domino for AS/400 mail recipient, you can use either the *Work with Directory Entries* (WRKDIRE) or the *Add Directory Entry* (ADDDIRE) command.

```
ADDDIRE USRID(NGB DOMINO) SYSNAME('DOMINO')
      USRD('Hans Neugebauer')
      LSTNAM('Neugebauer') FSTNAM('Hans')
      USRDFNFLD((SMTPAUSRID SMTP 'Hans_Neugebauer')
             (SMTPDMN SMTP 'SYSTEM01.DOMLAND.ACME.COM'))
      MSFSRVLVL(*DOMINO) PREFADR(*SMTP)
```

Let us briefly discuss the important parameter **in this context:**

USRID: This parameter consists of two mandatory parts called user ID and address (NGB and DOMINO in our example). You can freely choose the values for this parameter, provided that combination is unique within the system distribution directory. It is a common standard to use the AS/400 system name as the address for local users; however, since a Domino user cannot use OS/400 based mail, we chose the word `DOMINO` as the address to easily distinguish Domino users from OfficeVision and other OS/400 based mail users.

SYSNAME: For the system name, we purposely did not choose the AS/400 system name. Doing so would require an AS/400 user profile to be associated with the directory entry, but in order to use solely Domino for AS/400, there is no need to have an AS/400 user profile.

USRD: The description of the entry is mandatory, even though the value of this parameter is not used in this context. For documentation purposes, it is a good idea to enter the person's name as shown in our example.

LSTNAM, FSTNAM: An entry in the AS/400 system distribution directory does not require the person's real first and last name to be entered, but there are good reasons to do so:

- If you are planning to use directory synchronization, you need a key field, by default this is the first name and the last name.
- An OV/400 user sending mail can search the system distribution directory for the recipient's real name.
- You may want to document what person each entry is actually referring to.

USRDFNFLD: The two "user defined" fields, SMTPAUSRID and SMTPDMN, are used to store the SMTP address of the Notes user. These fields exist only after converting the directory. If you do not convert the SDD, you cannot supply the SMTP address as part of the *Add Directory Entry* (ADDDIRE) command and have to use option **1** and **F19** of the *Work with Directory Entries* (WRKDIRE) or the *Work with Names for SMTP* (WRKNAMSMTP) command instead[19]. The SMTP address must be unique; otherwise you will receive an error message (CPF89A4).

MSFSRVLVL: The value *DOMINO for the mail service level indicates that mail sent to this address goes directly to the Domino SMTP/MIME MTA via a plug-in in the AnyMail mail server framework (rather than sending it via the Internet or intranet).

PREFADR: The preferred address of *SMTP indicates that the SMTP address needs to be used to reach this user, (rather than the user ID/address pair or the X.400 O/R address for example).

---

[19] Another consequence from this is: You cannot write a CL program to associate an SMTP address with the SDD entries, unless you convert the SDD.

Instead of using the *Add Directory Entry* (ADDDIRE) command, you can also use option **1** (Add) or option **2** (Change) of the *Work with Directory Entries* (WRKDIRE) command. The displays are slightly different, but the contents of the necessary parameters are the same as described above.

There are two differences with the user interface, however:

- The message service level and the preferred address are entered in the form of numeric options, that is, option **4** and option **3** have to be entered in place of *DOMINO and *SMTP.
- Regardless whether or not the directory was converted, you have to press **F19** (*Change name for SMTP*) to enter the SMTP address.

In any case, as mentioned earlier, the easiest way to add the entries describing Domino in the AS/400 system distribution directory is to use directory synchronization. Use the description given above, to understand what these entries should look like.

Using the MTA for Multiple Partitioned Servers

At any time, the SMTP MTA can be active on only one Domino server on an AS/400 system. However, there are possibilities to send and receive SMTP mail through *all* partitioned servers on an AS/400 system.

As long as all servers are in the same domain, it is the easiest thing in the world: Just make sure the PAB can be replicated between the servers and it does not matter at all on which server your mail file is. (However, you may define in a connection document which, if any, databases you want to allow to replicate and whether or not you want mail routing to take place).

If the servers are in different Notes domains, you have to perform some more configuration steps: Create a Domain document and a Connection document in each of the two PABs, and cross certify the server IDs. If needed, you can set up the Connection document that way, that you do not allow database access across domain - just sending and receiving mail only.

The only drawback here, is that you are not very flexible in what SMTP domain (the right side of the @ sign in the address) can be used. For example to send SMTP mail to a user residing in the "MTA-domain" you can specify an address such as:

```
Joanne_Mindzora@Myfirm.com
```

Now, assuming the name of the other Domino domain would be `OrgA`, to send mail to users, use one of the following formats:

```
Kelly_Schmotzer.OrgA@Myfirm.com (the default)
Kelly_Schmotzer%OrgA@Myfirm.com
Kelly_Schmotzer@OrgA.Myfirm.com
```

Decide on the format (for all users on all servers!) when you set up the MTA.

If you have several partitioned servers on the same AS/400 system, all of them needing to use the mail integration, it may be a good idea to define one partitioned server exclusively to do nothing else but running the MTA, thus providing protection against failures of other server functions. Having a separate server would also allow you to run the MTA server under a lower priority or different storage pools than the other servers and traditional AS/400 applications.

Additional Information for Troubleshooting

The following sections provide some information on how to solve potential problems.

Where to Look if the MTA Does Not Start

If you are using the MTA for the first time or if you have doubts the MTA was started correctly, the first thing to do is to look for messages on the Domino console immediately after the MTA was started.

```
                         Work with Domino Console

Previous subcommands and messages:
                       Domino9.nsf                      5
  Team7 User7/WrkShp
                       domino7.nsf                      4
  Team2 User2/WrkShp
                       domlab2.nsf                      5


> load smtpmta

  > load smtpmta

  06/25/98 11:03:06 AM  SMTPMTA: 'MTACFGetConfigData()' line 786 file
  'mta/mta_pi.lib/s/mtactx.c' I:13274: Unable to get Global domain in the N&A
  Book
  06/25/98 11:03:06 AM  SMTPMTA: SMTP MTA Configuration Data starts ...
Enter a Domino subcommand.
===> ____________________________________________________________________________

F3=Exit   F5=Refresh   F6=Print   F9=Retrieve
F17=Top   F18=Bottom   F21=Command line
```

Figure 85. Attempting to Start MTA with Incomplete Configuration

The example in Figure 85 shows the situation where an attempt was made to start the MTA without having it configured correctly (”Unable to get Global domain in the N&A Book”). Even though the MTA does start, most likely it will not work properly because it could not open the global domain document and therefore had to use defaults for the configuration parameters.

Possible reasons for this are:

- The SMTP MTA was not configured, that is parameter MAIL(*SMTPMTA) was not specified when the *Configure Domino Server* (CFGDOMSVR) command was performed or, if you used Operations Navigator to configure the server, the option SMTP MTA of the *Internet Mail Packages* was not checked.

The SMTPMTA Is Already Running on This System

After trying to load the SMTP/MIME MTA you may see the message "The SMTPMTA is already running on this system" on the Domino console or in the LOG.NSF database:

```
                          Work with Domino Console

Previous subcommands and messages:
  06/12/98 11:01:47 PM  AMgr: Agent 'CrossPost Articles' in 'nntppost.nsf'
  does not have proper execution access, cannot be run
  06/12/98 11:21:08 PM  Periodic full text indexer starting, performing hourly
  full text indexing
  06/12/98 11:21:09 PM  Periodic full text indexer terminating
  06/12/98 11:24:04 PM  The Administration Request database - admin4.nsf - on
  AcmeDS1/Acme is currently a wildcard replica.
  06/12/98 11:24:04 PM  The Administration Process on AcmeDS1/Acme will not
  work until an Administration Server has been designated for this
  domain's Public Address Book.
> load smtpmta

  > load smtpmta

  06/12/98 11:35:38 PM  SMTPMTA: The SMTPMTA is already running on this system
Enter a Domino subcommand.
===> ____________________________________________________________________________

F3=Exit    F5=Refresh    F6=Print    F9=Retrieve
F17=Top    F18=Bottom    F21=Command line
```

Figure 86. The SMTPMTA Is Already Running on This System

The reason for this is, only one partitioned server can have the SMTP/MIME MTA active. However, users on all Domino servers can still send and receive SMTP if mail routing between the servers was set up correctly. See "Using the MTA for Multiple Partitioned Servers" on page 199 for more information.

Description of the SMTP MTA Tasks

DRT (or DRTask): The Delivery Report task - deletes all messages that have been successfully sent or received. For messages that have experienced some kind of permanent failure, the Delivery Report Task generates a Non-delivery Report or Undeliverable Message Notification back to the sender and will also notify the administrator of any dead mail.

IMSGCNV: The Inbound Message Conversion task - converts messages received by the Inbound Session Handlers to a Notes format. It also converts the destination

user address to a Notes format and checks that this address is deliverable. If the message is not convertible or the address is not deliverable, it will indicate the message has failed delivery so that a Non-delivery Report can be generated. If the message is not destined for Notes, it will put the message into the work queue for the Outbound Transport.

SMTPMTA: The Add-in Controller - the Notes task that is loaded on the Notes server. It acts as the control point for all other MTA tasks.

OMSGCNV: The Outbound Message Conversion task - converts Notes messages into an SMTP/MIME format ready for transmission.

OSESCTL: The Outbound Session Controller task - controls the transport of the converted messages to their respective SMTP destinations.

OSESHLRn: The Outbound Session Handler(s) - child processes of the OSESCTL. The handlers perform the actual tasks of connecting to the destination or next hop in the SMTP system, delivering the message(s) and passing back any errors.

Note The OSESHLRn tasks will only appear when mail is being sent.

ISESCTL: The Inbound Session Controller task - controls the receiving of messages from other SMTP systems. Note that this task works differently compared to the MTA running on other platforms in the sense it does not listen on SMTP port 25 directly. It then notifies an Inbound Session Handler to take the connection so that it can listen for a new connection.

ISESHLRn: The Inbound Session Handler(s) - accept incoming connections from the ISESCTL. On Domino platforms other than the AS/400 system, they perform the SMTP protocol handshaking with the sending system. Because of the integration with AnyMail/400 they read the incoming data from an IFS file and write it to the work queue.

Note The ISESHLRn tasks will only appear when mail is being received.

Accessing Log Information

All mailing events occurring on a Domino server are logged in database log.nsf. To find out about configuration problems with your MTA, you can open the *Mail Routing Events* view in log.nsf and analyze the logging entries. FigureFigure 87 shows an example where the MTA is being started, at a time when several outbound mail items were already in the outbound mail queue.

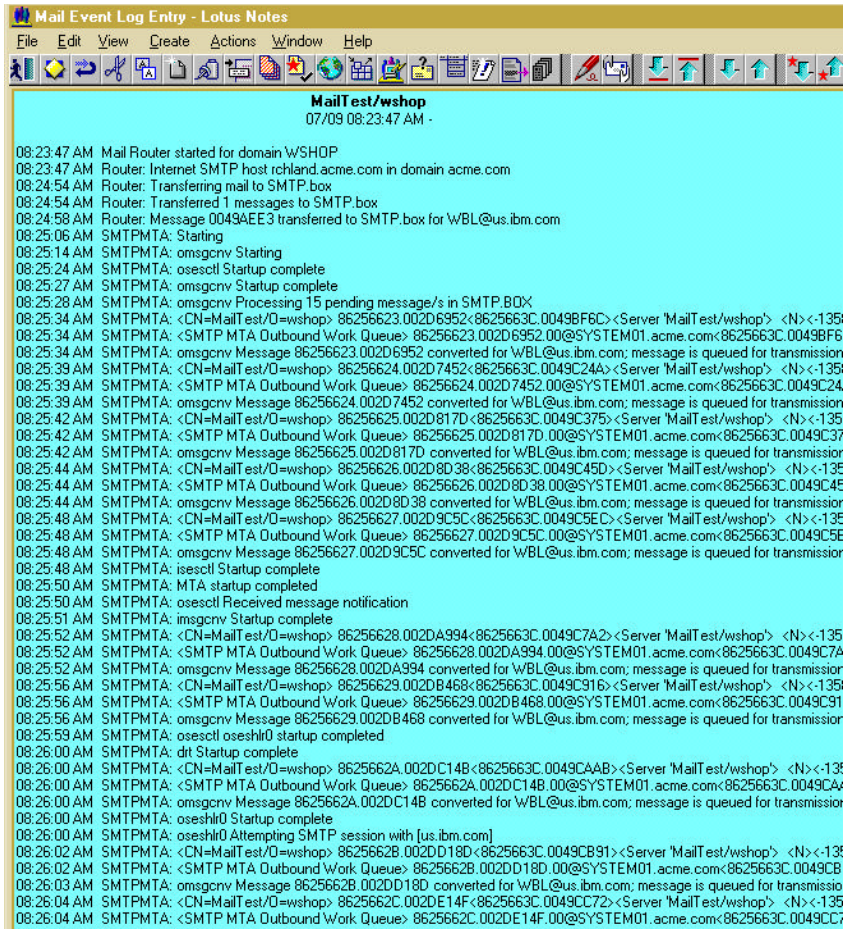


Figure 87. Example of Mail Routing Events with SMTP/MIME MTA Installed

Common Problems

This section describes commonly seen problems configuring or using the MTA and their solutions.

Server Document Shows 'Feature not installed'

If you see the message "Feature not installed" under the title *Internet Message Transfer Agent (SMTP MTA)* in the server document after configuring the MTA for that server, the reason is most likely that the public address book is based on a template older than Domino 4.6. This can happen easily if you added the Domino

for AS/400 server to an existing Domain and the design of Public Address Book of that domain was not yet replaced[20].

In such a case you may not see any error message during configuration, nor when you start the SMTP MTA. Even sending SMTP mail to Notes users may work successfully.

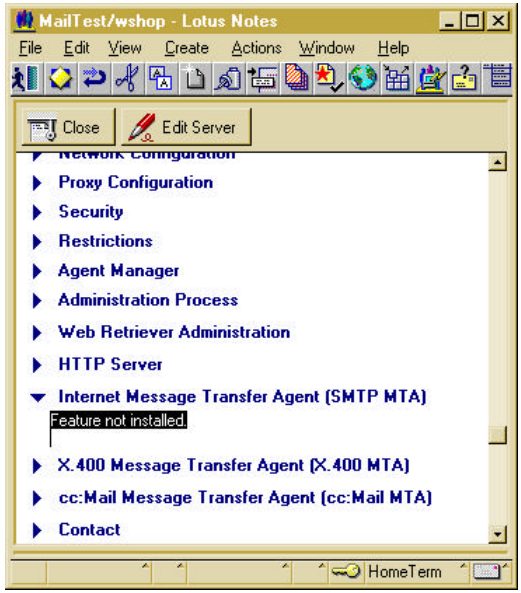


Figure 88. Feature Not Installed

In this case, the MTA configuration was probably successful, however the Pubic Address Book does not contain the correct forms to show you the contents of the configuration parameters. The solution for this is to replace the design of the **names.nsf** file using the Domino 4.6 Public Address Book template.

Mail Not Sent from OV/400 to Domino

There is a problem with OV/400 mail not getting to Domino when both Domino and the OV/400 reside on the same system and the system was upgraded from a OS/400 Version 3 Release 7 or earlier. The following describes the solution:

1. End MSF (ENDMSF from OS/400 command line)
2. From the Domino console, issue the **show tasks** command and press **F5**. Repeat until all of the SMTPMTA Inbound tasks are idle.
3. End the Domino SMTPMTA Inbound transport tasks by entering the following Domino console command:

[20] Remember, when adding a new server to an existing domain, a replica of the existing public address book will be copied from the "NAB-server" to the new server, thus the template of the existing PAB is used.

```
tell smtpmta stop inbound transport
```

4. We need to delete the exit points that have the wrong exit program data. From an OS/400 command line, issue the following command:

   ```
   call qtcp/qtmmsnap parm(remove)
   ```

   This will delete the exit points.

5. Now we need to create the exit points with the correct exit program data. From an OS/400 command line, issue the following command:

   ```
   call qtcp/qtmmsnap
   ```

   This will create the exit points just deleted with correct exit program data.

6. Now verify that the changes were made correctly:

   - Issue the command WRKREGINF EXITPNT(QIBM_QZMF*) from the OS/400 command line. You will see the *Work with Registration Information* display.
   - Enter option **8** (= Work with exit programs) by putting an **8** in front of the two items (as shown in Figure 89 in bold) and press the **Enter** key:

```
                    Work with Registration Information

Type options, press Enter.
  5=Display exit point   8=Work with exit programs

                          Exit
     Exit                 Point
Opt  Point                Format    Registered  Text
 _   QIBM_QZMFMSF_ACT     MSFF0100     *YES     MSF Accounting Exit
 _   QIBM_QZMFMSF_ADR_RSL MSFF0100     *YES     MSF Address Resolution
 8   QIBM_QZMFMSF_ATT_CNV  MSFF0100     *YES     MSF Attachment Conversion
 _   QIBM_QZMFMSF_ATT_MGT MSFF0100     *YES     MSF Attachment Management
 8   QIBM_QZMFMSF_ENL_PSS  MSFF0100     *YES     MSF Envelope Processing
 _   QIBM_QZMFMSF_LCL_DEL MSFF0100     *YES     MSF Local Delivery
 _   QIBM_QZMFMSF_LST_EXP MSFF0100     *YES     MSF List Expansion
```

Figure 89. Work with Registration Information

Next use option **5** to display the exit program. The display should be similar to the one shown in Figure 90. Notice that 02AN should be the last 4 characters of the Exit program data.

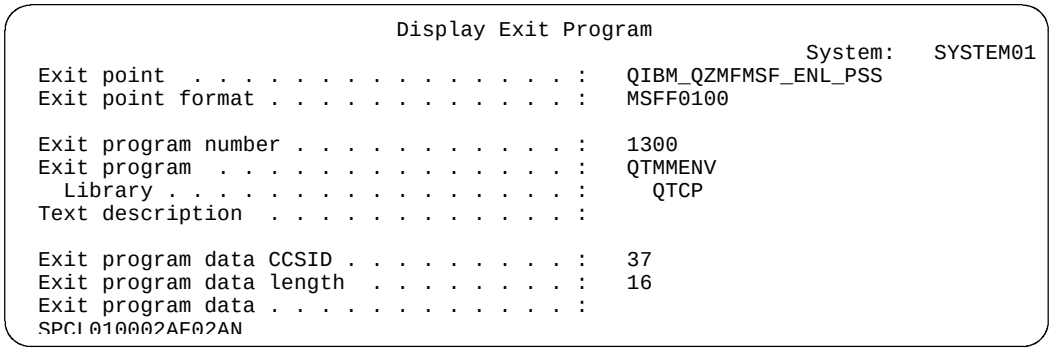

Display Exit Program
System: SYSTEM01
Exit point . . . . . : QIBM_QZMFMSF_ENL_PSS
Exit point format . . . . . : MSFF0100
Exit program number . . . . . : 1300
Exit program . . . . . : QTMMENV
Library . . . . . : QTCP
Text description . . . . . :
Exit program data CCSID . . . . . : 37
Exit program data length . . . . . : 16
Exit program data . . . . . :
SPCL010002AF02AN

Figure 90. Display Exit Program

7. The failed items should be removed from Domino. This must be done manually:
   - Issue the OS/400 command
     `cd "/qibm/userdata/lotus/smtpmta/inbound/inprog"`
   - Issue the OS/400 command wrklnk
   - Remove each file listed by using option **4** before the file name. (It is important that MSF is still ended. If not, you may be deleting new mail!)
   - Issue the OS/400 command
     `cd "/qibm/userdata/lotus/smtpmta/inbound/mail"`
   - Issue the OS/400 command wrklnk
   - Remove each file listed by using option **4** before the file name. (It is important that MSF is still ended. If not, you may be deleting new mail!)
8. Now restart MSF (STRMSF from an OS/400 command line) to pick up the changes.
9. Restart the Domino SMTPMTA inbound transport (tell SMTPMTA start inbound transport from the Domino console).

This change will allow MSF to process data for Domino and the inbound session handlers (ISESHLR) will no longer fail trying to process mail from OfficeVision/400 running on the same AS/400 system as Domino is running on.

No Host Names in Domino Mail Log for MTA Entries

This is not an error. Because Domino for AS/400 uses the SMTP support of OS/400 for sending and receiving messages, the SMTP MTA does not have access to host names. As a result, the SMTP log entries have blank host names.

Percent Sign in the User Part of the SMTP Address

Normally when a percent (%) sign is used in an SMTP user address sent to an AS/400, the % is used to indicate that the string to the right of the % is an SMTP route and is treated this way by the OS/400 SMTP support. Domino uses the % character to optionally indicate to a Domino server domain "path" in SMTP to return addresses it generates when sending SMTP/MIME mail from Domino using the Domino SMTP MTA.

A PTF was developed so that the OS/400 SMTP function can support the use of % in SMTP addresses in Domino.

To allow % to be used in SMTP addresses and not have these addresses handled as an indicator of an SMTP route, load and apply the PTFs listed below.

If you wish to take advantage of this change, follow the instructions below.

After applying these fixes, a data area, QUSRSYS/QTMSPRCNT, must be created:

```
CRTDTAARA DTAARA(QUSRSYS/QTMSPRCNT) TYPE(*CHAR)
```

Once the data area is created, SMTP support should be stopped (ENDTCPSVR *SMTP)[21] and restarted (STRTCPSVR *SMTP). QMSF job(s) should also be stopped (ENDMSF) and restarted (STRMSF). If the '%' in SMTP addresses function needs to be disabled for some reason, then the data area should be deleted:

```
DLTDTAARA DTAARA(QUSRSYS/QTMSPRCNT)
```

and these functions should be stopped and restarted again.

POP3 users can have a '%' in their address (ex: pop%user@myas400.com) as configured in their SDD entries and they get their mail in their POP3 mailbox. POP3 users that send to addresses that have '%' in their user ID and use the AS/400 as their "sending" mail server can do so.

OV/400 users can also have a '%' in their address and they get their mail in their OV/400 mailbox. However, if Domino for AS/400 is installed this only works when the data area `QUSRNOTES/DOMINOSMTP` is also created. This is due to the Domino Address Resolution snap-in that appears to take the message with a % address bound for the OV/400 user into the Domino server's MTA.

When Domino for AS/400 is installed, OV/400 users, POP3 users, or anyone sending SMTP mail into an AS/400, are able to send SMTP mail to a Domino user with a % in their address. The mail gets to that user's Domino mailbox if the address correctly identifies the Domino user in the server Public Address Book (PAB).

---

[21] Tip: Be careful with the *End TCP/IP Server* (ENDTCPSVR) command, the default is to end all TCP/IP server applications. Therefore do not press the **Enter** key after keying ENDTCPSVR; either press the **F4** key or key in ***SMTP**.

Note This will not work when the data area `QUSRNOTES/DOMINOSMTP` is created. The implication is that if '%' is used in OV/400 SMTP alias addresses, then it cannot be used in Domino users' addresses on the same AS/400 system. Again, this is caused by a problem in the Domino Mail Server Framework snap-in.

The PTFs that fix this in V4R2 are for 5769TC1: PTF SF47371 and PTF SF47805, and for 5769SS1: PTF SF47375.

Problems With Sending Large Messages or Large Attachments

When sending mail, the AS/400 SMTP/MIME support breaks up messages that are above 126KB. Unfortunately, some mail clients do not follow the SMTP/MIME recommendations for allowing to reassemble split messages. This would result in a problem situation that small messages can be sent to a particular mail server, while bigger ones cannot.

You have two options available to avoid problems with these types of clients:

- To change maximum message size to be sent without splitting, use the *Change POP Server Attributes* (CHGPOPA) command as follows:

  ```
  CHGPOPA MSGSPLIT(2048)
  ```

- If you want to totally disable the message split function, you may use the *Create Data Area* (CRTDTAARA) command to create the data area, QTMSNOSPLT, of type *CHAR in the QUSRSYS library. The content of the data area is not important; the existence of the data area will prevent outgoing mail from being split.

  When the data area exists, the CHGPOPA MSGSPLIT parameter setting is ignored. Outgoing SMTP messages are no longer split, regardless of their destination.

AS/400 SMTP/MIME support will continue to reassemble any split incoming messages.

Notes with Mixed Address Lists Not Sent to Every Recipients

If an OfficeVision/400 user sends the same piece of mail to a mixed list of recipients, for example a POP3 client using the AS/400 POP3 server and a user of the Lotus Domino for AS/400 server, mail item may not be delivered to the POP3 client. This applies for mixed distribution lists as well as specifying the individual addresses directly with the note.

In such a case you will see the error messages TCP9676 and CPFAF98 in the job log of the QMSF job. The complete message text for TCP9676 is shown in Figure 91.

```
                    Additional Message Information

Message ID . . . . . :   TCP9676       Severity . . . . . :   40
Message type . . . . . :   Diagnostic
Date sent  . . . . . :   09/23/98      Time sent  . . . . . :   13:21:39

Message . . . . :   SMTP distribution not sent.  Unable to parse data.
Cause . . . . . :   SMTP message forwarding was stopped because bad data was
  detected in  NO EOH CRLFCRLF.
Recovery  . . . :   Resend the SMTP distribution.
Technical description . . . . . :   If a service call is required, the
  following information should be forwarded:  location ID = 1141.
```

Figure 91. Message TCP9676 in Job QMSF

The workaround for this problem is to use the *Change Distribution Attributes* (CHGDSTA) command and specify to keep all recipients' addresses. Type the following command in any AS/400 command line on *each AS/400 system* in your network where OfficeVision/400 is used to send notes to Domino users:

```
CHGDSTA KEEPRCP(*ALL)
```

Note Independent of this problem, it is always recommended to set the KEEPRCP parameter to *ALL.

After the error TCP9676 appeared for the first time, it will always appear again, because one ore more corrupted messages remain in the queue. You can recover from this situation by clearing the MSF buffers. At a time with low or no mail traffic, key the following commands in any AS/400 command line:

```
ENDSBS QSNADS

ENDTCPSVR *SMTP

ENDMSF

STRMSF MSGOPT(*CLEAR)

STRTCPSVR *SMTP

STRSBS QSNADS
```

The option `MSGOPT(*CLEAR)` deletes all messages in the MSF queues. Ending the QSNADS subsystem and the SMTP server before resetting MSF ensures, you do not loose any other mail in transition.

Note The workaround shown here only solves the problem when sending notes (option 4 of the OfficeVision menu), if you send OfficeVision/400 messages (option 3), you currently cannot use a mixed addressee list.

Chapter 5
Directory Synchronization

After giving a short overview of purpose and concepts, this chapter describes the configuration and usage of the Domino for AS/400 Directory Synchronization, which comes as part of the AS/400 Integration option of Domino for AS/400.

What Is Directory Synchronization?

The Domino server, as well as OS/400-based mail applications such as OfficeVision for AS/400, object distribution services or the POP3 server, uses a directory to maintain information about the users of that mail application.

These directories contain information such as the first name, last name, department, phone number, address, company, and electronic mail address of an individual. In addition to containing information about users of your system or server, these directories also contain information about users on other systems or servers. This makes it easier to send mail to those people without having to remember the exact mail address.

On the AS/400 system, the information about all users of the OS/400-based mail applications is kept in a single directory - the system distribution directory (SDD). Domino servers keep the user information in the Public Address Book (PAB). In addition to information about users, the PAB also contains important configuration information for one or more Domino servers.

Note The configuration settings that are stored in the PAB, such as server, connection, domain, and other documents, are *not* part of the data that is handled by directory synchronization.

Why Store the Same Information in Multiple Directories?

Domino for AS/400 directory synchronization provides the capability to automatically synchronize user information in a Domino Public Address Book with the user information in the AS/400 system distribution directory. By taking advantage of directory synchronization, you can avoid manually updating information for the same user in two places.

The reason why it can be useful to store information about the same users on more than one system is the fact that you not only have the (mandatory) information about people sending and receiving mail on the same system; it is also beneficial to have information about the people that users are *sending* mail *to*. That is, when composing an e-mail, the sender can search for the recipient's common first and last name, rather than needing to memorize an artificial mailing address. Also, the address can be verified on the sender's system, rather than on the recipient's system or application.

The Concept of Directory Synchronization

You can think of directory synchronization as a form of replication that updates a Domino address book[1] with the changes being applied to the AS/400 system distribution directory (SDD), or updating the SDD based on changes being made in the Domino Address Book, or both, depending on the way that you configure it.

Directory synchronization is also similar to directory shadowing, which allows you to synchronize the system distribution directories on two AS/400 systems.

Note that directory synchronization only updates the directory information; it does not affect information stored in the AS/400 user profile or the Notes user ID file, such as the password or object authorities.

To determine whether directory synchronization is right for you, consider how you plan to use each directory. Here are some points to consider:

- Many AS/400 system functions use the AS/400 system distribution directory. You may have more entries in the directory than you realize. For example, Client Access and AS/400 OfficeVision users always need to be included in the system distribution directory. Use the *Work Directory Entry* (WRKDIRE) command to check the list of entries in the system distribution directory.
- Your AS/400 system distribution directory may already include entries for people in other locations with whom you exchange electronic mail. By synchronizing directories, you make it easy for your Domino users to also send mail to those people.
- The Public Address Book on your Domino server may contain a large amount of information. Perhaps it was replicated from another Domino server. Directory synchronization can make this information available to AS/400 users.

Domino for AS/400 directory synchronization is a powerful function that can help simplify the management of user directory information. However, as with any powerful tool, be sure that you take the time to understand its capabilities, and to plan carefully so that the integrity of your directories is maintained. Be sure to

---

[1] This can be the Public Address Book (PAB) or any other address book based on the same `pubnames.ntf` template.

consider how you are already using other similar functions. For example, you may already be using one or more of the following capabilities:

- Shadowing AS/400 system distribution directories between multiple AS/400 systems.
- Shadowing the AS/400 system distribution directory to a Notes or Domino server on an AS/400 Integrated PC Server.
- Replicating the Domino Public Address Book between Domino servers.

For more information about managing the AS/400 system distribution directory, see the AS/400 book *SNA Distribution Services*, SC41-5410. Information on the Domino Public Address Book can be found in many places of the *Domino Administration Help* (helpadmn.nsf) database, especially Chapter 3 in *Getting Started with Domino*, which is also available as a printed book.

You can set up directory synchronization through the *Directory Sync Configuration* database (NNDIRSYC.NSF) on the Domino server. Messages related to directory synchronization are written to the *Directory Synchronization Log* database (NNDILOG.NSF). If you have more than one Domino server on your AS/400 (partitioned servers), each server has its own NNDIRSYC.NSF and NNDILOG.NSF. However, directory synchronization can be active on only one Domino server on the same AS/400 system at the same time.

To use directory synchronization, you must select product option one (AS/400 Integration) and product option six (HiTest C API) of the Domino for AS/400 software when installing the software using the *Load and Run* (LODRUN) command. For details on installing the Domino for AS/400 options, see "Installing the Domino Software" in Chapter 2.

Directory Synchronization Concepts

In order to use directory synchronization, you should understand several terms and concepts. The following section describes the most important of these.

Public Address Book

The Public Address Book plays a central role in the configuration, maintenance and management of Domino servers. A Public Address Book is the control and administration center for a group of Domino servers (a domain). Each Domino server must have a replica of the Public Address Book for the domain installed in its data directory. This address book contains documents that provide information needed by the Domino servers. For example, the Public Address Book *must* contain a Person document for each user in the Domino domain, and it *may* contain information about other people that you want to send mail to or simply work with. Each Person document contains a group of fields with specific information about

the user, such as last name, first name, middle initial, telephone number, postal mailing address, and e-mail address.

AS/400 System Distribution Directory

The AS/400 system distribution directory (SDD) is similar to Domino's Public Address Book, in the sense that it contains entries to describe people using the AS/400 system's mail capabilities (excluding Domino), as well as information about mail recipients on other systems (including Domino for AS/400). For example, an AS/400 directory entry contains fields for the user's last name, first name, middle initial, telephone number, postal mailing address, and information on routing e-mail. An entry in the AS/400 distribution directory is required in order to use AS/400 e-mail capabilities. Only one SDD exists on any AS/400 system.

Field Mappings

Because the fields in the Domino Public Address Book contain the same type of user information as the fields in the AS/400 system distribution directory, you can define relationships (mappings) between specific fields in the Domino address book and the AS/400 directory. Each field mapping is a link between a specific field in the Domino address book and a specific field in the AS/400 directory. During directory synchronization, the field mappings determine which information from the source directory or address book should go into which field in the target directory or address book.

The directory synchronization function provides default field mappings which include the most commonly used fields, such as name, address, telephone, and company. You can remove mappings, specify additional mappings, or change the default mappings.

You can also specify more than one mapping to a particular target field. If the first mapping does not contain a value, directory synchronization continues processing the mappings in the order listed until one of the mappings produces a value. You can also create a mapping that inserts a specified character string (rather than the value of a field) into a target field. For example, you might create a mapping to insert the character string 'xxx' in the department name field of the Domino Public Address Book entry if the same field in the system distribution directory is empty.

Key Mappings

You must designate at least one field mapping as a key mapping. When you specify that a particular field mapping is a key mapping, the mapping target field is used by directory synchronization as a key field to distinguish one target directory entry from another. In the default set of field mappings, last name and first name are used as key mappings. If you have more than one person in your system distribution directory or Public Address Book with the same first name and last name, use additional key mappings to distinguish between them. For example, you could add a key mapping for department name. Be sure that you have enough key

mappings to clearly distinguish all entries. You can specify up to ten key mappings with unique target fields.

Fields that are used as the target of key mappings should always be filled in when a directory entry is created. If any key mapping field in an entry is empty, that entry is ignored during directory synchronization. Remember that a directory entry may be created directly by you, or it may be created by directory synchronization as a result of an addition to the other directory. To help make sure that a target field for a key mapping is not left empty, you can provide multiple field mappings for the same target field, as described earlier. When you provide multiple mappings to the same key field, you must designate all of the mappings to that field as key mappings. You can create as many key mappings as you like using the same target field, but there can only be ten unique fields that are the target of a key mapping.

Prerequisites for Directory Synchronization

The design of directory synchronization configuration is based on the following requirements and assumptions:

- To use directory synchronization, product option one (AS/400 Integration) and product option six (HiTest C API) of the Domino for AS/400 software must be installed on the AS/400 system. For details, see "Installing the Domino for AS/400 Product on your AS/400 System" in Chapter 2.
- To use the directory synchronization configuration database, you must have a Win32 workstation (such as Windows 95 or NT) with Notes 4.5 or higher, or an OS/2 client with Notes 4.5.3 or higher. If you use a VGA display, you must use more than 16 colors.
- The Domino Address Book being synchronized must be in the Notes data directory on the Domino server.
- The default Domino Address Book is the Public Address Book (NAMES.NSF), but any other address book using the same template (PUBNAMES.NTF) can be synchronized.
- Only one configuration is allowed per Domino Address Book.
- Only one configuration per AS/400 system is allowed to be enabled. Configurations may exist for other Domino Address Books, but those configurations must be disabled.

- If you have more than one Domino server on your AS/400 (partitioned servers), each server has its own NNDIRSYC.NSF and NNDILOG.NSF. However, the initial release of directory synchronization will only synchronize one Domino Address Book with AS/400 SDD. If the Domino administrator wants synchronization with other address books (also on other Domino servers on the same AS/400 system) to take place, they can use replication (or subset replication) to synchronize with these other PABs.
- If you ever change the AS/400 user ID delimiter, the AS/400 host name, or the AS/400 domain name, or select Domino SMTP MTA configuration fields, you must edit and save the enabled directory synchronization configuration document. If you want these changes to take effect immediately for all AS/400 directory and Domino Address Book entries, choose Yes to Populate Directories when editing the enabled directory synchronization configuration document.

Configuring Directory Synchronization

Configuration of directory synchronization is done using a Notes client interface. A Notes database called *Directory Sync Configuration* (NNDIRSYC.NSF) is shipped with the function. The Domino administrator must configure directory synchronization between the AS/400 system distribution directory and a specified Domino Public Address Book (PAB) at the Domino server, by opening that database and filling in several Notes forms. Messages related to directory synchronization are written to the Domino for AS/400 Log database (NNDILOG.NSF).

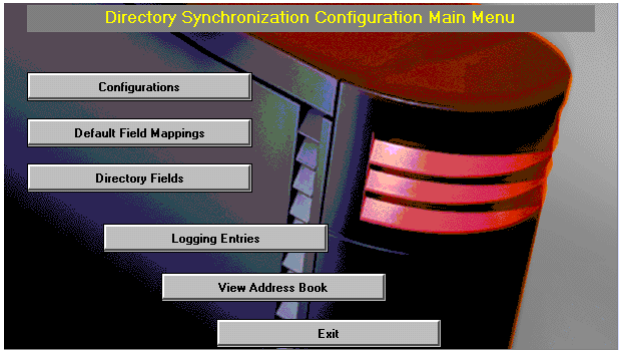


Figure 92. Directory Synchronization Configuration Main Menu

There are three types of documents in the Directory Synchronization Configuration database:

Configuration documents describe the Domino Public Address Book being synchronized, the type of synchronization desired, which directory entries should

be synchronized, and whether entries in one directory should be used to populate the other directory.

Field mapping documents describe how information is mapped from the fields in one of the directories to fields in the other directory.

Field documents describe the fields that can be synchronized in the AS/400 system distribution directory and in Person documents of the Domino Public Address Book.

The Directory Synchronization function runs as a stand-alone application. It does not end when you shut down the Domino server. To simply end the jobs, you should enter the following command in any AS/400 command line or include in a CL program:

```
CALL QNOTESINT/QNNDIEND
```

More information is provided in the Synchronization Status section of "Directory Synchronization Configuration Steps" on page 226 later in this chapter.

The Directory Synchronization function does co-exist with the Domino replication function, the Directory Shadowing function between multiple AS/400 systems, and the Directory Synchronization function of Domino running on the Integrated PC Server (IPCS) in the AS/400 system. However, in such an environment, it is the administrator's responsibility to ensure that no endless loops occur (refer to Figure 116 on page 250 for an example).

Directory Synchronization Configuration Tips

The following items should be considered before you create or change a directory synchronization configuration:

- It is recommended that you make backup copies of the Domino Public Address Book and the AS/400 directory before using directory synchronization in a production environment. Here is an example of using the AS/400 *Save Object* (SAVOBJ) command to back up the system distribution directory to a tape device called TAP01:

  ```
  SAVOBJ OBJ(qaok*) LIB(qusrsys) DEV(tap01)
              OBJTYPE(*file)
  ```

  Here is an example of using the AS/400 SAV command to back up the Domino Public Address Book to a tape device called TAP01:

  ```
  SAV DEV('/qsys.lib/tap01.devd')
              OBJ('/notes/data/names.nsf')
  ```

  To create a copy of an existing Public Address Book, choose **File - Database - New Copy**.

  In the "Copy Database" dialog box, specify the name of the Domino server and a name of the copy. Remember that the Domino Address

book must be in the Notes data directory (or a sub directory) on the Domino server, and that it must have the same format as the Public Address Book; that is, it must be based on the template StdR4PublicAddressBook (pubnames.nsf).

It is a good idea to first test directory synchronization with a copy of the Domino Public Address Book. After verifying that all of the entries as well as those that you want to be synchronized are shown in the target directory, you are ready to use directory synchronization in a production environment. You then can edit the test configuration, change its status to disabled, create a new configuration for the PAB, and enable that one.

- Disable a directory synchronization configuration before changing key fields in the configuration. This is to make sure that you clear the internal links (pointers) which were set for the fields between SDD and PAB during population to improve performance. For more information about population, see the section "Populate Directories" in "Directory Synchronization Configuration Steps" on page 226. Edit the configuration first and change its status to Disabled. Then edit the configuration again and change the key fields.
- Do not replicate the Directory Sync Configuration database. When you change a configuration, you must open the database on the Domino for AS/400 server.
- Directory synchronization is a stand-alone application. Synchronization continues even when you shut down the Domino server.

  You can stop the directory synchronization jobs (QNNDI*) running in the QSYSWRK subsystem by issuing the following AS/400 command:

  ```
  call qnotesint/qnndiend
  ```

  Alternatively, you can enter the following Domino command on the Domino console command line:

  ```
  load qnndiend
  ```

  It may take 4 to 5 minutes to end the jobs. However, this will not end the job called QNNDILCK in subsystem QSYSWRK. This job prevents more than one server from enabling a configuration so it behaves as a never ending program. An undocumented method to end this job is to use the following AS/400 command:

  ```
  call qnotesint/qnndiend *ALL
  ```

  You can restart the jobs by issuing the following command:

  ```
  call qnotesint/qnndistj
  ```

  Alternatively, you can enter the following Domino command on the Domino console command line:

  ```
  load qnndistj
  ```

- Do not use the *Set Secure* command to password-protect the server console. If you do, the directory synchronization jobs will fail. If the server console is password-protected, use the Set Secure command to remove password protection and then restart the directory synchronization jobs.

Directory Synchronization Concepts

When you set up directory synchronization by creating a configuration in the *Directory Sync Configuration* (NNDIRSYC.NSF) database on the Domino server, you need to specify several options that are used during directory synchronization.

Synchronization Type

As shown in Figure 93, the synchronization can be either one way (unidirectional) or two way (bi-directional). With unidirectional synchronization, you specify whether the AS/400 directory is used to update the Domino address book, or the Domino address book is used to update the AS/400 directory. With bi-directional synchronization, both the AS/400 directory and the Domino address book are used to update each other.

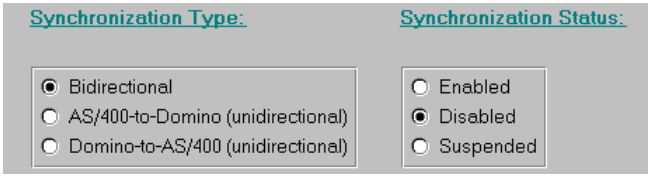
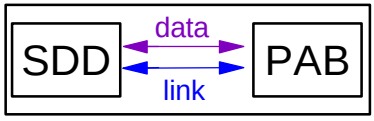


Figure 93. Types and Status Values for Directory Synchronization

Synchronization Status

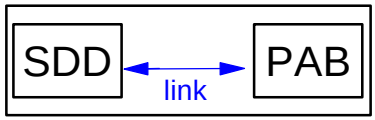
While the configuration is *enabled*, directory synchronization actions occur as defined in the configuration. You can only have one configuration enabled on your AS/400 at a time.



Configuration enabled

When the configuration is disabled or suspended, directory synchronization does not occur for this configuration. A *suspended* configuration retains internal links (pointers) between the entries in the AS/400 directory and the Domino address book. These links improve the startup performance if you later change the status to

enabled.



Configuration suspended

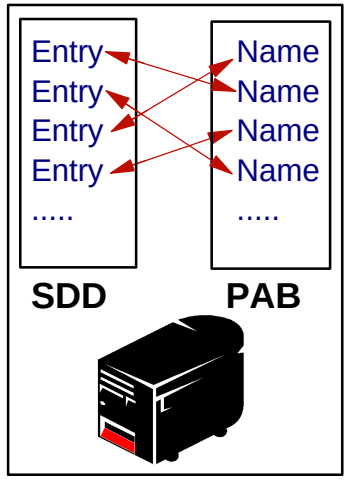
A *disabled* configuration does not retain those internal links. For more information about internal links, see “Populate Directories” below.

Configuration disabled

Because the internal links are not cleared for a *suspended* configuration, entries that have those links are reserved for use only by that configuration. If you create another configuration that uses a different address book to update the AS/400 directory, the reserved entries are not used in directory synchronization. Therefore, if the other address book has an entry that maps to a reserved entry in the AS/400 directory, directory synchronization creates a second, duplicate entry in the AS/400 directory.

Populate Directories

When you first set up a configuration for directory synchronization, the AS/400 directory and Domino address book probably contain different entries; however, you will need them to have the same entries when you start directory synchronization. Therefore, you must fill or populate the AS/400 directory with entries from the Domino Public Address Book, or populate the Domino Public Address Book with entries from the AS/400 directory. For bi-directional synchronization, you must do both.



During population, internal links (pointers) are set between the fields of the SDD and the fields of the PAB. In this way, the entries point to each other, and subsequent synchronizations for that entry will be much faster. Use of population is not a requirement for directory synchronization to occur, but populated directories will synchronize faster than non-populated directories. When directories are not populated, a synchronization event will require a search of the target directory

in order to find the corresponding entry, rather than having direct access to the entry via the pointer.

Once the directories are populated, the internal links for all subsequent changes (for example, insertion of a new entry) will be set automatically. Therefore, after running a population, the configuration will default to **Populate No**.

If a connection is *disabled*, the internal links are cleared. If you enable synchronization again without running population, from now on the internal links are set when entries are changed. However, in order to reflect all of the changes that were performed while synchronization was stopped, it is necessary to run population again. This will also reset the internal links for unchanged entries, resulting in faster synchronization.

If a connection is *suspended*, the internal links are not cleared. However, in order to populate (fill) all new entries that were added to the directories while directory synchronization function was stopped, it is necessary to run population again.

On the population screen you can specify a date and time for population to occur. When the configuration has been saved, the *Work with Job Schedule Entries* (WRKJOBSCDE) command on the AS/400 system can be used to both verify and to change the population job start date and time.

If you choose to populate directories for bi-directional synchronization, you must choose either the AS/400 directory or the Domino Public Address Book as the master directory. The directory synchronization function first uses the entries in the master directory to populate the secondary directory, and then uses the entries in the secondary directory to populate the master directory.

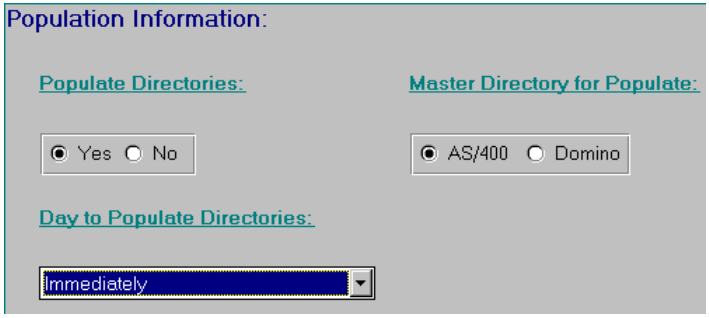


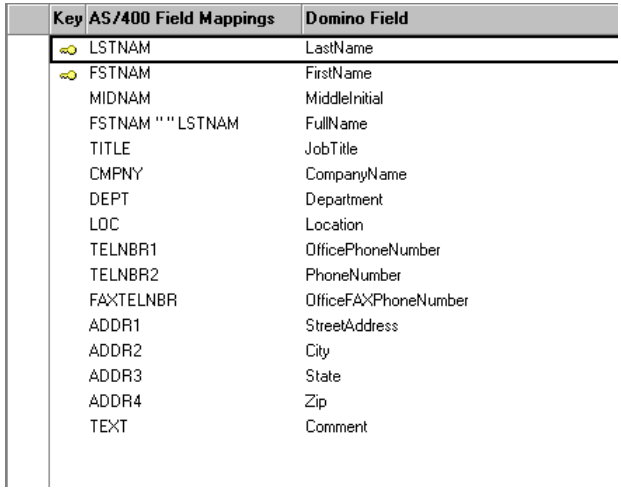
Figure 94. Population Information for Directory Synchronization

Field Mappings

The field mapping describe relationships between SDD fields (for example, USRID, USRADDR, LSTNAM, FSTNAM, etc.) and PAB fields (for example, LastName, FirstName, MailAddress, etc.) as shown in Figure 95.

A default set of common field mappings is shipped with the product (for example, name, address, telephone, company). You can change the existing mappings, add other mappings to the default set, or delete mappings from this set. The field mappings in each configuration must have at least one key field.

A key field is used to identify (find) directory entries in the other directory. It allows directory synchronization to distinguish one AS/400 directory entry or Domino Person Document from another. In the default field mappings, the last name field is a key field. However, be sure that you have enough key mappings to clearly distinguish all entries. For example, you may need to add key mappings for the first name and middle initial to distinguish entries that have the same last name. Only those user entries that produce a value in the key fields are mapped. A value must exist in every key field in order to be synchronized with the other directory.



Key	AS/400 Field Mappings	Domino Field
⚷	LSTNAM	LastName
⚷	FSTNAM	FirstName
	MIDNAM	MiddleInitial
	FSTNAM " " LSTNAM	FullName
	TITLE	JobTitle
	CMPNY	CompanyName
	DEPT	Department
	LOC	Location
	TELNBR1	OfficePhoneNumber
	TELNBR2	PhoneNumber
	FAXTELNBR	OfficeFAXPhoneNumber
	ADDR1	StreetAddress
	ADDR2	City
	ADDR3	State
	ADDR4	Zip
	TEXT	Comment

Figure 95. Default Field Mappings for Directory Synchronization

You can have a maximum of ten key mappings to different fields. However, you can have additional mappings to any of those ten key fields.

Note There is no verification done on configured mappings. For instance, the user may specify a mapping from SDD field LSTNAM to NAB field LastName, and a mapping from PAB field LastName to SDD field FSTNAM. This may or may not be what the user intended. Either way, no verification is done to restrict the user from doing this.

Synchronize All AS/400 Users or Selected Users

You can choose to synchronize all user entries or specific user entries that meet selection criteria. Only user entries that satisfy the selection criteria are mapped during synchronization. For example, you may want to synchronize only users who have specific names, or users who are in a particular department.

Directory Synchronization Configuration Steps

Access to create or modify documents in this *Directory Sync Configuration* (NNDIRSYC.NSF) database should be limited to Notes administrators only. The Access Control List (ACL) of this database should be modified to reflect this restriction. If you do not change the ACL, the default access is “manager”.

The following sections contain a step-by-step description of the necessary tasks to configure directory synchronization.

1. Open the directory synchronization configuration database on the Notes desktop.
   - Select **File - Database - Open**.
   - Select or type in the name of your Domino for AS/400 server.
   - Specify NNDIRSYC.NSF in the **Filename** section or select the database named *Directory Sync Configuration*, as shown in Figure 96.

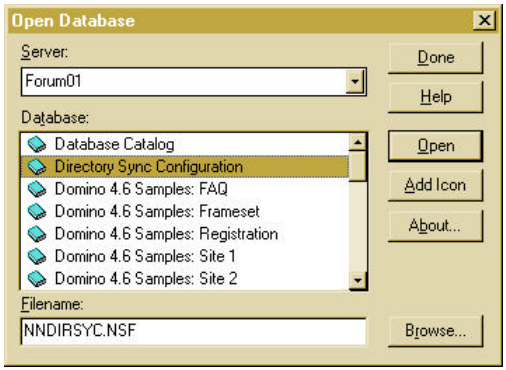


Figure 96. Open the Directory Sync Configuration (NNDIRSYC.NSF) Database

   - Click **Open**.
2. If you are opening this database for the first time, you will see the “About this Database” document. After reading it, close it by pressing the **Esc** key[2].

When opening the Directory Sync Configuration database, you must always start with the *Directory Synchronization Configuration Main Menu* (as shown in Figure 92 on page 219), the navigator for this database. It allows you to easily go to any of the important configuration functions or even to open the address book that is being synchronized.

[2] The “About this Database” document opens automatically only when you open the database for the very first time. If you want to read the document again at a later time, click **Help** and then **About this database**. There is also useful information in the **Using this database** document, which can be reached from the Help pull down.

3. In the *Directory Synchronization Configuration Main Menu* (as shown in Figure 92 on page 219), click **Configurations**.

4. To create a new configuration or change an existing one, click the **New Configuration** button. You will see the (initially empty) *Configurations\By Status* view which shows all configuration documents defining directory synchronization, as shown in Figure 97. You might want to change the size of the left pane (navigator pane) if you cannot completely see the navigator.

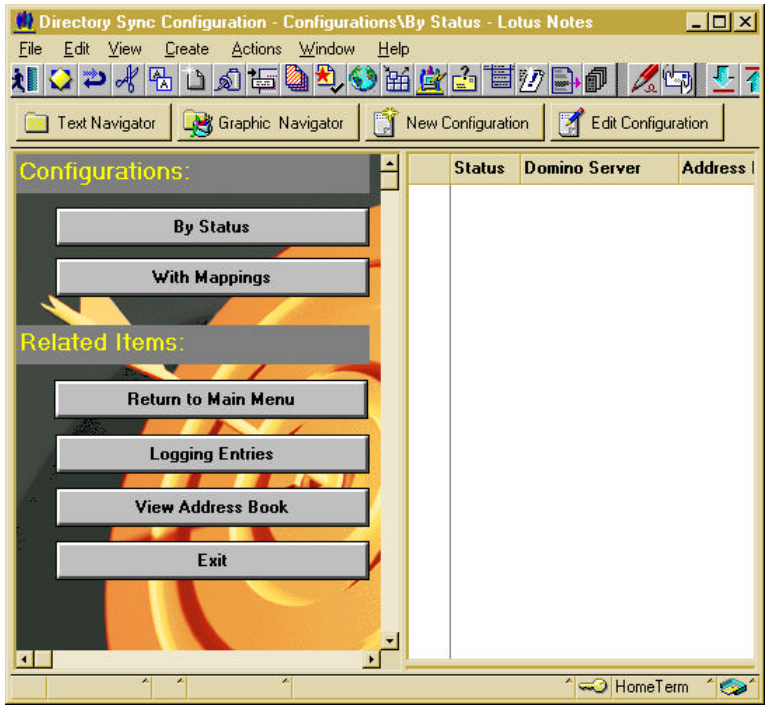


Figure 97. Initial Look of Directory Sync Configuration View

5. Specify the file name of the Domino address book to be synchronized, as shown in Figure 98. For example, if you created a test address book named TESTSYNC.NSF, specify that name. If you created the test address book in a subfolder, make sure to specify the full path (for example, WBL/TESTSYNC.NSF).

Note The name of the address must have 8 characters or less, followed by the characters ".NSF".

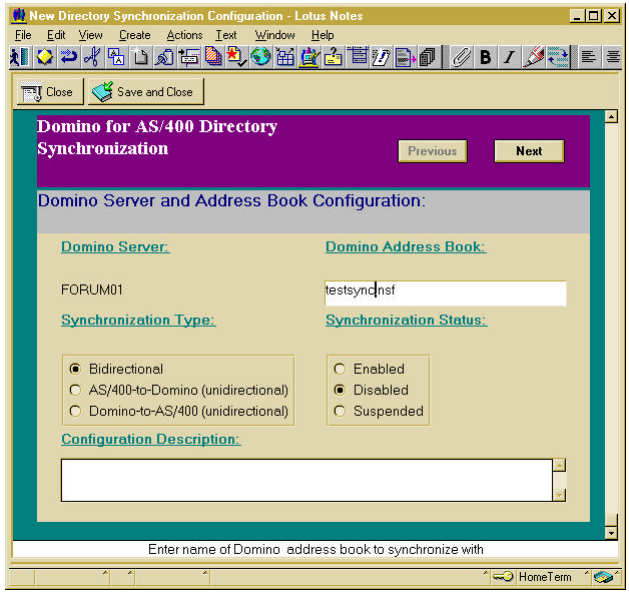


Figure 98. New Configuration for Directory Synchronization

6. Choose the **Synchronization Type** by clicking one of the following radio buttons:
   - Bidirectional
   - AS/400-to-Domino
   - Domino-to-AS/400
7. Select the **Synchronization Status** of either "Enabled," "Disabled," or "Suspended".

   Synchronization will not occur unless you choose the "Enabled" status. You can change the status now, or after you have saved the configuration by editing the document again.
8. Click **Next** and a form called Population Information (as shown in Figure 99) appears:
9. Choose **Yes** to Populate Directories if any of the following is true:

   w You chose AS/400-to-Domino synchronization and you want the Domino address book to contain all of the selected[3] entries that are in the AS/400 directory.

[3] "Selected" refers to the selection criteria defined later in step 25.

- You chose Domino-to-AS/400 synchronization and you want the AS/400 directory to contain all of the selected entries (Person documents) that are in the Domino Address Book.
- You chose bi-directional synchronization and you want both the AS/400 directory and the Domino Address Book to contain the same entries.

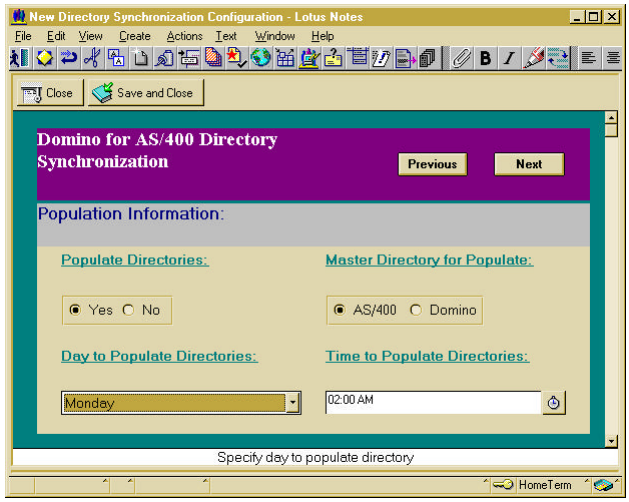


Figure 99. Population Information

If you choose to populate directories, you must provide additional information:

- For bi-directional synchronization, select either the AS/400 system distribution directory or the Domino address book as the master directory. The master directory is used first to populate the other directory.
- Choose when the populate operation should be done (either immediately or on a specific day and time).

10. Click **Next**.
11. If you chose Domino-to-AS/400 synchronization (unidirectional) only (see Figure 98 on page 228), continue with step 34 on page 236. (Note that the panel shown will be very similar to the one shown in Figure 100, but is **not** the same and actually defines the opposite direction of synchronization).

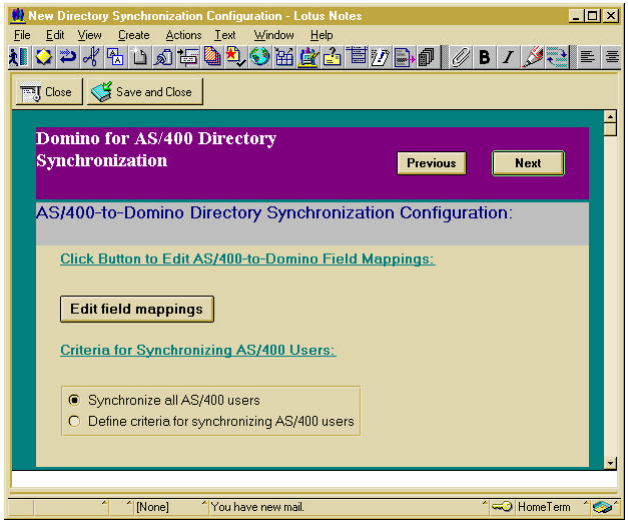


Figure 100. AS/400-to-Domino Directory Synchronization Configuration

12. You will see the form called "*AS/400-to-Domino Directory Synchronization Configuration:*" as shown in Figure 100.
13. If you want to change the field or key mappings, click the button **Edit field mappings**.

    Tip In some cases, an error message occurs at this point saying "View or Navigator 'AS4ToNABMapView' does not exist". The reason for this is very likely a bug in your Notes client. The solution is to obtain a more recent Notes client.

Figure 101. Error Messages When Trying to Edit Field Mappings

After clicking the **Edit field mappings** button, you will see the view called *Field mappings\AS/400-to-Domino* (Figure 102), showing you which fields are mapped for synchronization from AS/400 to Domino.

Note The field mappings are defined separately for each synchronization direction; that is, AS/400 to Domino and Domino to AS/400. To edit the field

mappings for Domino to AS/400, see step 35 on page 236.

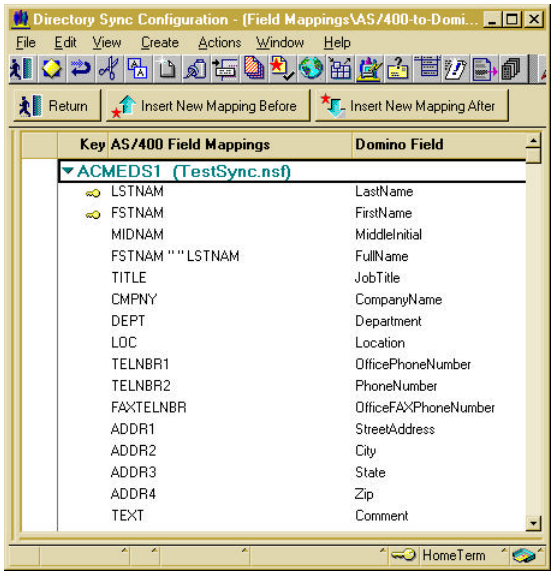


Figure 102. View Field Mappings for AS/400-to-Domino Synchronization

You can change existing mappings, remove existing mappings, or insert new mappings. Directory synchronization processes the mappings in the order in which they are listed. Therefore, if you choose to add a mapping, you must specify whether it should be inserted before or after an existing mapping.

To create a new AS/400-to-Domino field mapping definition, do the following:

14. Highlight a field mapping definition where you want to add a definition by single-clicking it.

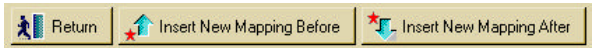


Figure 103. Insert New Mapping Before or After the Selected Mapping

15. Click either **Insert New Mapping Before** or **Insert New Mapping After**, and you will see the form shown in Figure 104.

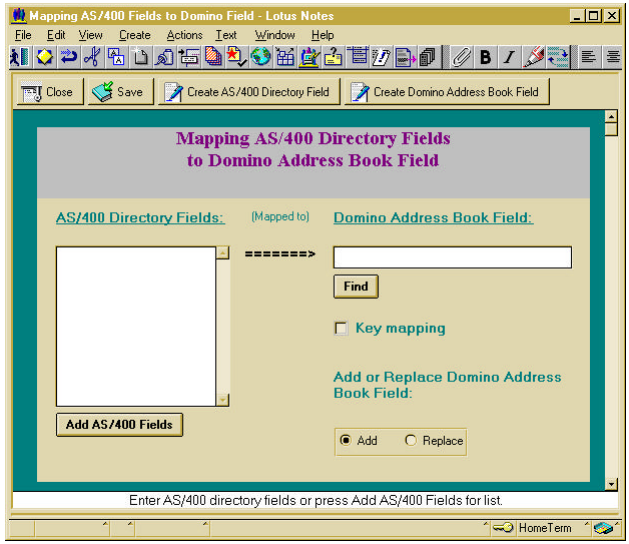


Figure 104. Add AS/400 Fields for Field Mapping

16. Click **Add AS/400 Fields** to display the AS/400 fields.
17. Select an AS/400 field. This field is the *source* for the mapping. Click the **Add** button.

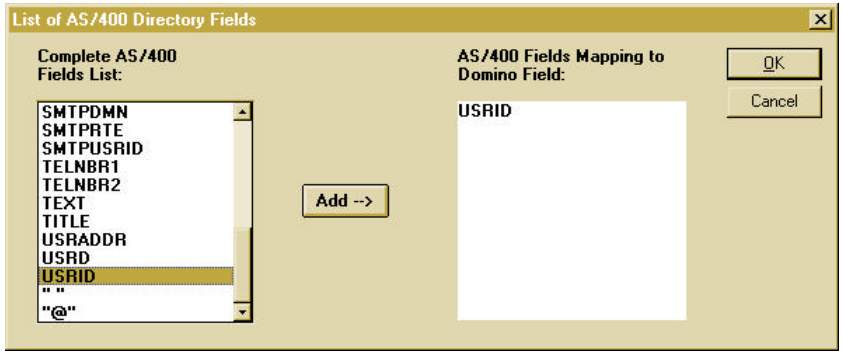


Figure 105. List of AS/400 Directory Fields

18. You may select multiple fields and then click **OK**.
19. Click **Find** to display the Domino fields.

20. Select a Domino field. This field is the *target* for the mapping.

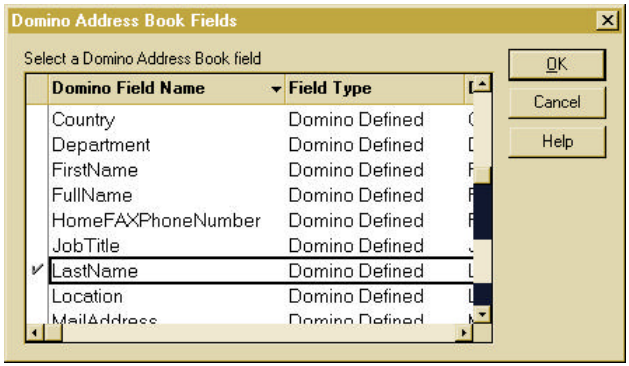


Figure 106. Domino Address Book Fields

21. Click **OK**.
22. Back in the form called "Mapping AS/400 Directory Fields to Domino Address Book Fields," click the **Save** button.
23. Click the **Close** button.

    Note To remove a field mapping, you must change the access control list for the Directory Sync database to allow deletions.

Alternate Mapping

There may exist one or more field mapping documents for the same target field. When more than one field mapping exists for the same target field, this is referred to as an alternate mapping. Additional field mapping for the same target field is used to provide a "backup" mapping to a field if the first mapping does not provide a value. Directory synchronization function processes the mappings in the order listed and uses the first mapping that produces a value.

24. Back in the view called *Field mappings\AS/400-to-Domino* (Figure 102 on page 231), click the **Return** button to return to the form called "*AS/400-to-Domino Directory Synchronization Configuration*," as shown in Figure 100 on page 230.
25. By clicking one of the two radio buttons, you can choose whether you want to do one of the following:
    - Synchronize all users (not recommended)
    - Define criteria for synchronizing specific users (recommended)
26. Click the **Next** button.

    If you choose to synchronize **all** entries (not recommended), continue with step 32 on page 235.

27. If you choose to define criteria for synchronizing AS/400 users, the following form appears:

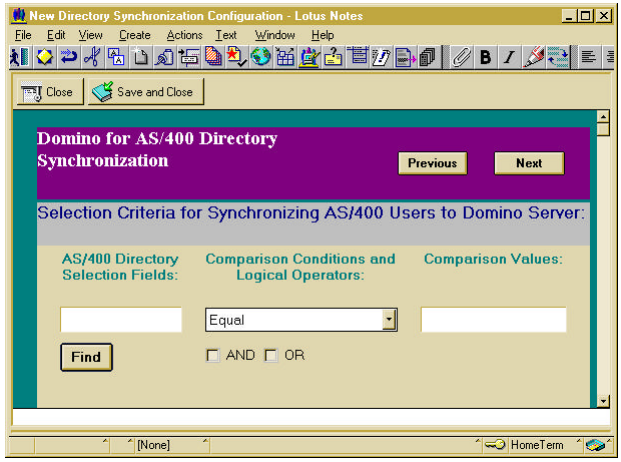


Figure 107. Selection Criteria for Synchronizing AS/400 Users to Domino

Note that the form shown in Figure 107 only appears if you selected the radio button “Define criteria for synchronizing AS/400 users” in the previous form, as shown in Figure 100 on page 230.

28. You don’t need to remember all of the field names of the AS/400 system distribution directory. Instead of entering the field name, you can click **Find** and select the field (see Figure 108). Then click **OK**.

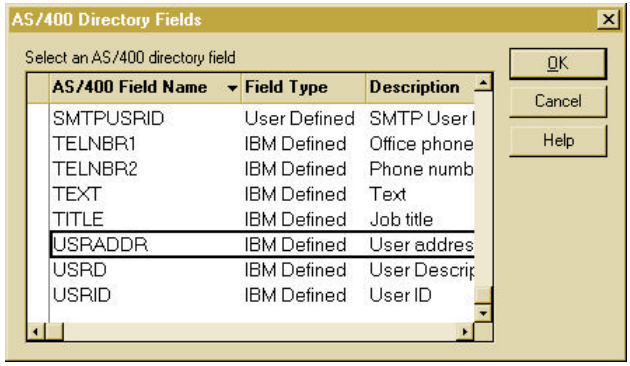


Figure 108. Select AS/400 Directory Fields

We have selected all entries where the address field contains the AS/400 systems name SYSTEM01 as shown in Figure 109.

29. A pull-down dialog allows you to select the comparison operator. In our example we chose “Equal.”

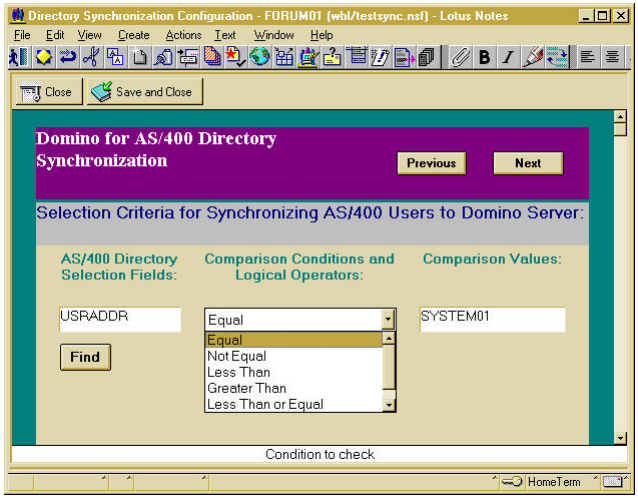


Figure 109. Choosing the Logical Operator for the Selection Criteria

30. Type the comparison value (SYSTEM01). The comparison values are not case-sensitive.

31. You may add up to two more comparison conditions just by clicking the **AND** or the **OR** button. If you do so, an additional line of input fields appears. Clicking the **AND** or the **OR** button again brings up the third line to define a comparison condition.

32. If you chose AS/400-to-Domino synchronization (unidirectional) only (see Figure 98 on page 228), continue with step 46 on page 238.

33. Clicking on the **Next** button brings you to the “Domino-to-AS/400 Directory Synchronization Configuration” panel.

Note The “*Domino-to-AS/400 Directory Synchronization Configuration*” form looks very similar to the “*AS/400-to-Domino Directory Synchronization Configuration*” panel as shown in Figure 100 on page 230. Make sure not to confuse these two panels or the ones following them. The first set of configuration parameters was related to one direction (AS/400 to Domino). We are now defining the opposite direction.

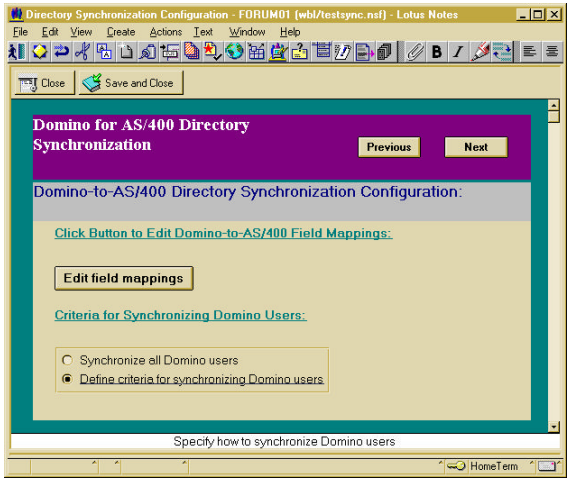

Directory Synchronization Configuration - FORUM01 (wbl/testsync.nsf) - Lotus Notes
File Edit View Create Actions Text Window Help
Close
Save and Close
Domino for AS/400 Directory Synchronization
Previous
Next
Domino-to-AS/400 Directory Synchronization Configuration:
Click Button to Edit Domino-to-AS/400 Field Mappings:
Edit field mappings
Criteria for Synchronizing Domino Users:
Synchronize all Domino users
Define criteria for synchronizing Domino users
Specify how to synchronize Domino users
HomeTerm

Figure 110. Domino-to-AS/400 Directory Synchronization Configuration

34. If you chose bi-directional or only Domino-to-AS/400 synchronization, you now need to provide similar information for the opposite direction.

35. If you do **not** want to change the field mappings for the Domino-to-AS/400 synchronization, go to step 43 on page 237.

36. Click the **Edit field mappings** button. You will see the view called *Field mappings\Domino-to-AS/400* (as shown in Figure 111236), showing you which fields are mapped for the Domino-to-AS/400 synchronization.

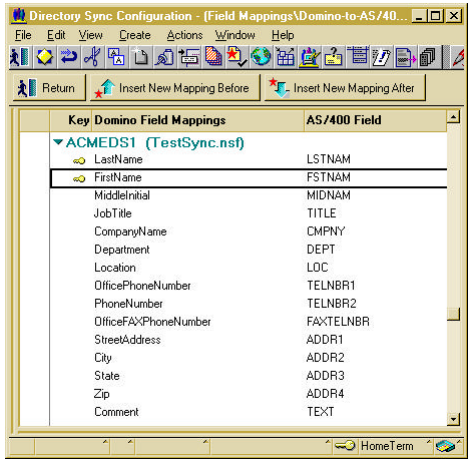


Figure 111. View Field Mappings for Domino-to-AS/400 Synchronization

To create a new AS/400-to-Domino field mapping definition, do the following:

37. Highlight a field mapping where you want to add a mapping by clicking on it.
38. Click either **Insert New Mapping Before** or **Insert New Mapping After**, and you will see the form shown in Figure 112.

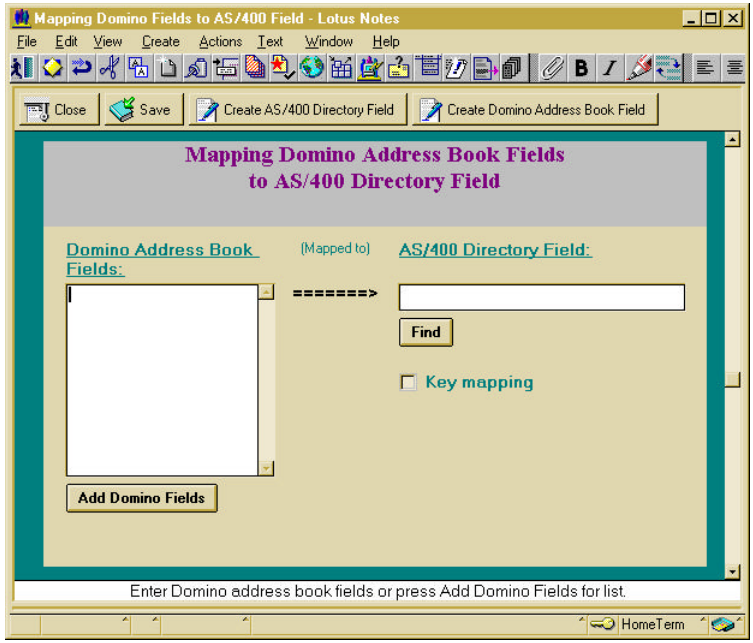


Figure 112. Mapping Domino Fields to AS/400 Field

39. You will now proceed as was described in the sections following Figure 104 on page 232, except that you now define the mapping from Domino fields to AS/400 fields, rather than vice versa.
40. After adding the field names, click **Save** and then click **Close**.
41. Back in the view called *Field mappings\Domino-to-AS/400* (as shown in Figure 111 on page 236), press **F9** to refresh the view.
42. Click the **Return** button to return to the form called "*Domino-to-AS/400 Directory Synchronization Configuration:*" as shown in Figure 110 on page 236.
43. Back in the "*Domino-to-AS/400 Directory Synchronization Configuration*" form, you can choose whether you want to synchronize all person documents in the Domino address (default) or if you want to define criteria for synchronizing the Domino users, by clicking the appropriate radio button.
44. Click the **Next** button.
45. If you did not click the radio button titled "*Define criteria for synchronizing the Domino users,*" continue with step 48.

46. You should now see the form called "*Selection Criteria for Synchronizing Domino Users to AS/400.*" To define selection criteria, follow the description given after Figure 107 on page 234, except that the base for the comparison is now one or more fields of the Domino Address Book, rather than the AS/400 SDD.

47. When you have finished defining the selection criteria, click the **Next** button.

48. You should now see the form titled "*Mail Related Information*" (Figure 113). Specify whether or not mail addressing information should be automatically synchronized.

    If you choose to maintain mail information, you may need to provide additional information:

    - For bi-directional synchronization, select either the AS/400 system distribution directory or the Domino Public Address Book as the master mail directory.

      When an AS/400 system distribution directory entry and a Domino Public Address Book entry are synchronized for the first time, the information in the master mail directory replaces the mail information in the other directory. When changes are made to either of the directory entries at a later time, the changed information replaces the mail information in the synchronized directory entry, regardless of which directory is the master mail directory.

    - For bi-directional synchronization or AS/400-to-Domino unidirectional synchronization with the populate option, specify how to handle existing AS/400 SMTP addresses.

      If you choose to map existing AS/400 SMTP addresses during the populate operation, an existing SMTP address in an AS/400 directory entry is inserted after any existing values in the ShortName field of the corresponding entry in the Domino Public Address Book. Once the populate operation is completed, existing SMTP addresses are not mapped in subsequent populate operations.

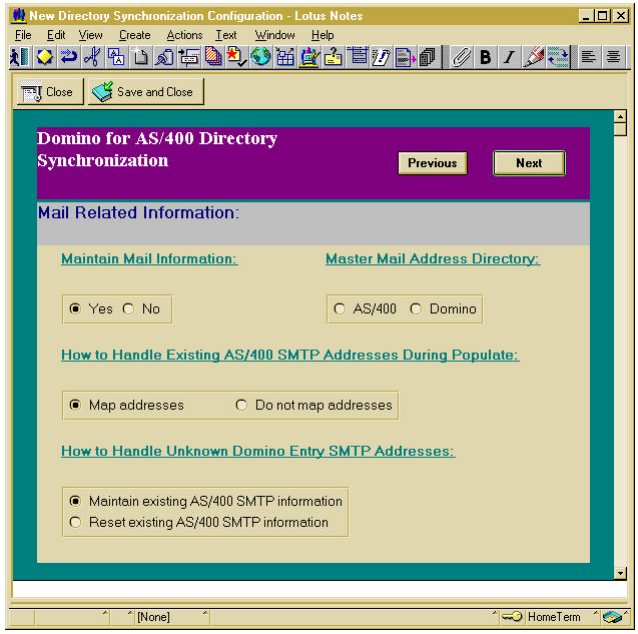


Figure 113. Mail Related Information

If you want to map existing AS/400 SMTP addresses during a bi-directional populate operation, it is best to select the AS/400 system distribution directory as the master directory. If you do not specify the AS/400 directory, directory synchronization displays a warning and allows you to change the master directory to the AS/400 directory.

For bi-directional synchronization or Domino-to-AS/400 unidirectional synchronization, specify how to handle unknown SMTP addresses in a Domino entry.

If you choose to maintain mail information see "Maintain Mail Information" on page 240.

49. Click **Next** and you will see the *"Advanced Information"* form.

50. On the Advanced Information display, you can specify any advanced options as needed. This display is intended to be used to activate further functional enhancements for directory synchronization, which will ship in the future without the need to replace the entire configuration database.

If you type in anything which is not supported, the text will be ignored.

51. Click the **Save and Close** button.

52. If this is a new configuration for that server and you did not change the field mappings earlier, the "*Create Field Mappings*" window is shown.

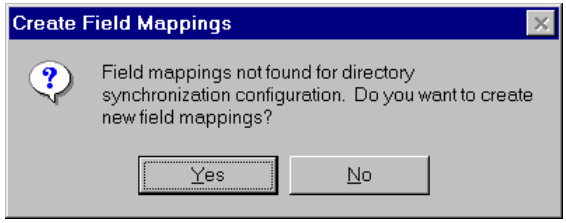

Create Field Mappings
Field mappings not found for directory synchronization configuration. Do you want to create new field mappings?
Yes
No

Figure 114. Create Field Mapping Window

Click the **Yes** button. This will add the standard field mappings of the starter set to your new configuration.

Maintain Mail Information

When you choose to maintain mail information, directory synchronization attempts to keep mail information synchronized between the AS/400 directory and Domino address book entries. How this is accomplished depends upon what type of directory synchronization is enabled (unidirectional versus bi-directional) and whether population is configured.

If bi-directional synchronization is configured, you must indicate whether you want the AS/400 directory or Domino address book to be the *master mail address directory*. Next, whenever an AS/400 directory entry and a Domino address book entry are synchronized for the very first time, the mail information located in the master mail address directory entry replaces any mail information in the synchronized directory entry. Once the entries have been synchronized, the mail information located in the directory entry being changed replaces any mail information in the synchronized directory entry, even if the entry being changed is not located in the master mail address directory.

If bi-directional synchronization or AS/400-to-Domino synchronization is configured and you have chosen to populate, you must indicate whether or not you want to map existing AS/400 SMTP addresses during population. If you choose to map existing AS/400 SMTP addresses during population, the existing SMTP addresses of AS/400 directory entries are inserted after any existing values in the ShortName field of the Domino address book entries with which the AS/400 directory entries are being populated. Once population has finished, this value is reset to not map existing SMTP addresses in subsequent populations.

Note If you want to map existing AS/400 SMTP addresses during bi-directional population, best results are obtained by selecting the AS/400 directory as the master directory for population. If you do not, a warning message will be posted which allows you to set the master directory for population to AS/400.

If bi-directional synchronization or Domino-to-AS/400 synchronization is configured, you must indicate whether *to maintain or reset the existing AS/400 SMTP information* of an AS/400 directory entry. You need to do this if the SMTP address of the synchronized Domino address book entry cannot be determined by the internal code of directory synchronization which is called to obtain the Domino SMTP address. If you choose to maintain the existing AS/400 SMTP information, none of the AS/400 directory entry mail information is changed if the SMTP address of the synchronized Domino address book entry cannot be determined. The AS/400 directory entry mail information fields that remain unchanged are: the Mail service level (MSFSRVLVL), the Preferred address (PREFADR), the SMTP user ID (SMTPUSRID), and the SMTP domain (SMTPDMN). However, if you choose to reset these fields and the SMTP address of the Domino address book entry is unknown, MSFSRVLVL and PREFADR are reset to the system defaults and SMTPUSRID and SMTPDMN are set to blank for the synchronized AS/400 directory entry.

Note If an SDD entry is set to Lotus Domino, and directory synchronization creates a *new PAB* entry from it, a person document is created. However, it is not enough to define a true Notes user. It is still necessary to register the Notes user ID before it can be successfully used by a person.

If you ever change the AS/400 SMTP user ID delimiter, the AS/400 host name, or the AS/400 domain name, or select Domino SMTP MTA configuration fields, you must edit and save the enabled directory synchronization configuration document. If you want these changes to take effect immediately for all AS/400 directory and Domino address book entries, choose Yes to Populate Directories when editing the enabled directory synchronization configuration document.

Create New Directory Fields for the Directory Fields List

You may also want to add new fields or literal fields to the list of predefined AS/400 or Domino fields. This can be done by using the **Create AS/400 Directory Field** or the **Create Domino Address Book Field** button in the *Mapping AS/400 Directory Fields to Domino Address Book Field* form (Figure 104 on page 232), or the *Mapping Domino Address Book Fields to AS/400 Directory Field* form (Figure 112 on page 237). You can also do this by clicking the **Directory Fields** button in the *Directory Synchronization Main Menu*.

Important No verification occurs by the addition of a field if the field really exists in the SDD or PAB. A non-existing field causes the synchronization to fail. Therefore, be sure that the fields really exist before you enable the synchronization.

When you add a user-defined AS/400 SDD field, you also need to specify the product ID of the user-defined field in the SDD. Note that the term “user defined” may be somewhat misleading, in the sense that some IBM products also create

"user-defined" fields; for example, when you convert the SMTP names. That is, after performing the *Convert SMTP Names* (CVTNAMSMTP) command, you will have the new "user-defined" fields SMTPAUSRID, SMTPDMN, and SMTPRTE (all with product ID SMTP) in the system distribution directory.

For IBM-defined fields (those fields that are always defined for the SDD), the product ID is already set to *IBM.

There is no real difference between adding a Domino-defined or a user-defined field. However, for user defined fields, you can add predefined properties that are included in a blank field in the Domino Address Book. It can also be used to keep track of the fields that were
added by the user.

Literal fields must be enclosed in double quotes (for example, "@").

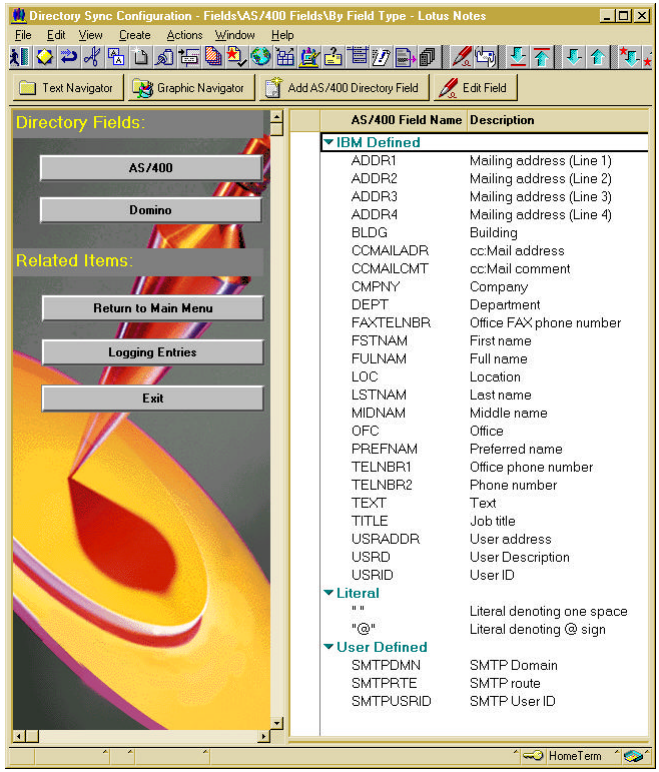


Figure 115. Fields View for AS/400 Fields

Fields in the System Distribution Directory and Address Book

The Directory Synchronization Functions map fields between the AS/400 system distribution directory (SDD) and the fields in a Domino Public Address Book. If

you want to change the default mapping, you must know which fields are defined in the SDD and the PAB.

IBM-Defined Fields in the SDD

To locate all IBM-defined fields contained in the system distribution directory, you can use the *Change Directory Entry (CHGDIRE)* command.

1. Type the following command in any AS/400 command line:

   CHGDIRE (do **not** press **Enter**)

2. Press **F4** (prompt).
3. Press **F9** (All Parameters).
4. Press **F11** (Keywords).

You see the field names in the center of your display along with a description on the left and the input fields on the right. Press the **PgDn** key to see the next set of fields. If you receive the error message "Parameter USRID required.", press the **PgDn** key a second time. The purpose here is not to enter any information. You are using the command prompter to see which field names are available.

User-Defined Fields in the SDD

For a quick path to view all "user-defined" AS/400 fields, the *Change System Directory Attributes (CHGSYSDIRA)* command can be used.

1. Type the following command in any AS/400 command line:

   CHGSYSDIRA (do **not** press **Enter**)

2. Press **F4** (prompt).
3. Page down (press the **PgDn** key one or more times) to the **User-defined fields**.

Fields in the Domino Address Book

Below is a safe way to locate all of the fields that are contained in the Domino Address Book:

1. Select the Domino Address Book by clicking its icon on your workspace.
2. Choose **File - Database - Design Synopsis**.
3. In the Design Synopsis window, select **Database** and **Forms**.
4. To obtain a list of the Persons fields only, deselect all of the forms in the Forms window except **Person**.
5. Click **OK**.

Enabling, Disabling, or Suspending Directory Synchronization

Domino for AS/400 Directory Synchronization is fully managed via the *Directory Sync Configuration* database (NNDIRSYC.NSF). This includes enabling, disabling or suspending this function. The following topics describe how to do so.

Starting Directory Synchronization

Before you can enable directory synchronization, you need to configure it as described in the previous topics (see Directory Synchronization Configuration Steps" on page 226). Enabling directory synchronization is done by changing the synchronization status field to "Enable" in the configuration document.

1. Double-click the icon for *Directory Sync Configuration* database:

   Proceed with step 6.

   - or -

2. On the Notes desktop, choose:
   File - Database - Open from the menu bar.
3. Select or key in the name of the **Domino for AS/400 server**.
4. Select Directory Sync Configuration database (NNDIRSYC.NSF).
5. Click the **Open** button.
6. Click the **Configurations** button.
7. Select the configuration document that you want to enable and click **Edit Configuration**.
8. Change the status of the configuration to **Enabled**.
9. Click **Save and Close**.

Note If you enabled directory synchronization and chose to populate the directories, the first synchronization can take a while (expect each directory entry to take 2 - 4 seconds to be processed). This depends on the amount of data and the synchronization type.

It is possible to check the progress and the result of the synchronization directly from the configurations menu. To do so, check the *Directory Synchronization Log* (NNDILOG.NSF) database by clicking **Logging Entries**.

To view the contents of the Domino Address Book which is being synchronized, click **View Address Book**. This is only possible when a configuration is enabled.

The Directory Synchronization function runs as a stand-alone application. Therefore, a shutdown of the server doesn't end directory synchronization.

For more information about the different types of status, see *"Synchronization Status"* of "Directory Synchronization Configuration Steps" on page 226 .

Stopping or Suspending Directory Synchronization

Directory synchronization is terminated if you disable or suspend the directory synchronization configuration.

1. Open the directory synchronization configuration database on the Notes desktop as follows:
   - Choose **File - Database - Open**.
   - Select the **Domino server**.
   - Select Directory Sync Configuration **(NNDIRSYC.NSF).**
   - Click **Open**.
2. Click **Configurations**.
3. Select the configuration document for the configuration that you want to terminate and click **Edit Configuration**.
4. Change the status of the configuration to **Disabled** or **Suspended**.
5. Click **Save and Close**.

Directory synchronization may take up to 5 minutes to terminate.

AS/400 environment

In some cases, you may want to stop or start the AS/400 synchronization jobs. When you stop the synchronization jobs, all directory changes are saved and will be synchronized when you restart the jobs. This is useful if you want to temporarily stop synchronization during a period of heavy system workload, but still want changes reflected in the other directory at a later time. In addition, if a Domino server error occurs, the directory synchronization jobs may not restart automatically even if the configuration is still enabled.

You can stop the directory synchronization jobs (QNNDI*xxx*) that are running in the QSYSWRK subsystem by issuing the following AS/400 command:

```
CALL QNOTESINT/QNNDIEND
```

Alternatively, you can enter the following Domino command on the Domino console command line:

```
load qnndiend
```

The program QNNDIEND does **not** end the job QNNDILCK. To end this job too, you may use an undocumented function by using the following command:

```
CALL QNOTESINT/QNNDIEND *ALL
```

You can restart the jobs by issuing the following command:

```
call qnotesint/qnndistj
```

A user profile that has *JOBCTL special authority is required to either stop or start the directory synchronization jobs.

What Happens After Enabling Directory Synchronization

When you specify a status of Enabled in a directory synchronization configuration document and then save the configuration document, the following events occur:

- **For AS/400-to-Domino unidirectional synchronization**

  When any entry that satisfies the selection criteria is added to, deleted from, or changed in the AS/400 system distribution directory, the corresponding entry is immediately changed in the Domino address book. The key mapping fields in the configuration document define the corresponding entry in the Domino Address Book.

  If you chose Yes for the Populate Directories option, entries from the AS/400 system distribution directory that satisfy the selection criteria, and that have a value in every key field, are copied to the Domino Address Book as new or changed Person documents. This population operation occurs at the specified day and time.

  A synchronization of user fields occurs if an entry in the Domino directory has the same key field values as the entry in the AS/400 directory. Otherwise, a new entry will be added first.

  Note Creation of a Person document in the PAB does not register this person as a Notes user and does not create a user ID file. If you want an AS/400 user to become a Notes user, you will still need to register that person in Domino.

- **For Domino-to-AS/400 unidirectional synchronization**

  When any entry that satisfies the selection criteria is added to, deleted from or changed in the Domino address book, the corresponding entry is immediately added to, deleted from or changed in the AS/400 system distribution directory. The key mapping fields in the configuration document define the corresponding entry in the AS/400 system distribution directory.

  If you chose Yes for the Populate Directories option, entries from the Domino Address Book that satisfy the selection criteria and have a value in every key field are copied to the AS/400 system distribution directory as new or changed entries. The population operation occurs at the specified day and time.

  A synchronization of user fields occurs if an entry on the AS/400 directory has the same key field values as the entry in the Domino directory. This process does not create a user profile on the AS/400. If a Notes user also needs to access AS/400 applications (other than Domino for AS/400), an AS/400

administrator must to register a user with the *Create User Profile* (CRTUSRPRF) command.

- **For Bidirectional Synchronization**

  When any entry that satisfies the selection criteria is added to, deleted from or changed in either the AS/400 system distribution directory or the Domino Address Book, the corresponding entry is immediately added to, deleted from or changed in the other directory. The key mapping fields in the configuration document define the corresponding entries in the AS/400 system distribution directory and the Domino Address Book.

  If you chose Yes for the Populate Directories option, entries from the master directory that satisfy the selection criteria are copied to the secondary directory as new or changed entries. Next, entries from the secondary directory that satisfy the selection criteria are copied to the master directory as new or changed entries. These population operations occur at the specified day and time.

Coexistence of Directory Synchronization, Replication and Shadowing

Domino for AS/400 directory synchronization is one of several functions that synchronizes information with the system distribution directory and the Domino address book. In an environment consisting of one or more Domino servers and one or more AS/400 systems, you could actually use a combination of the following functions:

- Domino/Notes replication synchronizes the content of the Public Address Book (or any other Notes database) on different Domino servers and Notes clients.
- AS/400 Directory Shadowing allows you to synchronize entries in the AS/400 system distribution directories on two or more AS/400 systems. For information about directory shadowing refer to the book *AS/400 Advanced Series SNA Distribution Services*, SC41-5410.
- OS/400 Integration of Lotus Notes Directory Shadowing applies changes to entries of the AS/400 system distribution directory to the Domino address book on a server running on the **AS/400 Integrated PC Server**. For information about OS/400 Integration of Lotus Notes directory shadowing refer to the book *AS/400 Advanced Series OS/400 Integration of Lotus Notes*, SC41-5431.

You can use all of the functions mentioned above in combination with directory synchronization. Be aware however, that in certain environments synchronization loops may be created, resulting in performing updates for an indefinite period of time. It is the responsibility of the system administrator to avoid those loops, when setting up the different synchronization functions. The following section shows one example of, how such an indefinite loop may occur and what you can do to avoid it.

Never Ending Updates

A simple example of a synchronization loop can be seen for the following situation: Two AS/400 systems, `SYSTEM01` and `SYSTEM02` are using AS/400 Directory Shadowing to synchronize their system distribution directories. On each AS/400 system you also have a Domino for AS/400 server running, each using directory synchronization to maintain the Domino Public Address Book and the AS/400 system distribution directory as well as replication to propagate changes to the address book.

A further assumption with this scenario is that synchronization, shadowing and replication operate on the entire directory, that is propagating local entries as well as entries describing users of other systems. To keep the scenario simple, all types of synchronization are only performed in the direction indicated in Figure 116.

An endless loop can be initiated by changing an entry in the directory of SYSTEM01. The following steps will occur:

1. An AS/400 user changes a directory entry using the Change Directory Entry (CHGDIRE) command.
2. The changed entry will be synchronized with a person document in the Domino Public Address Book.
3. The person document will be replicated to the Domino for AS/400 server on SYSTEM02.
4. Directory synchronization will update the corresponding entry in the system distribution directory on SYSTEM02.
5. OS/400 directory shadowing will change the same entry in system distribution directory on SYSTEM01.
6. Directory synchronization on SYSTEM01 does not recognize that the change performed in the previous step originated on the same system and therefore updates the person document in the Domino Public Address Book with the same values.

7. The process continues indefinitely by starting over with step 3.

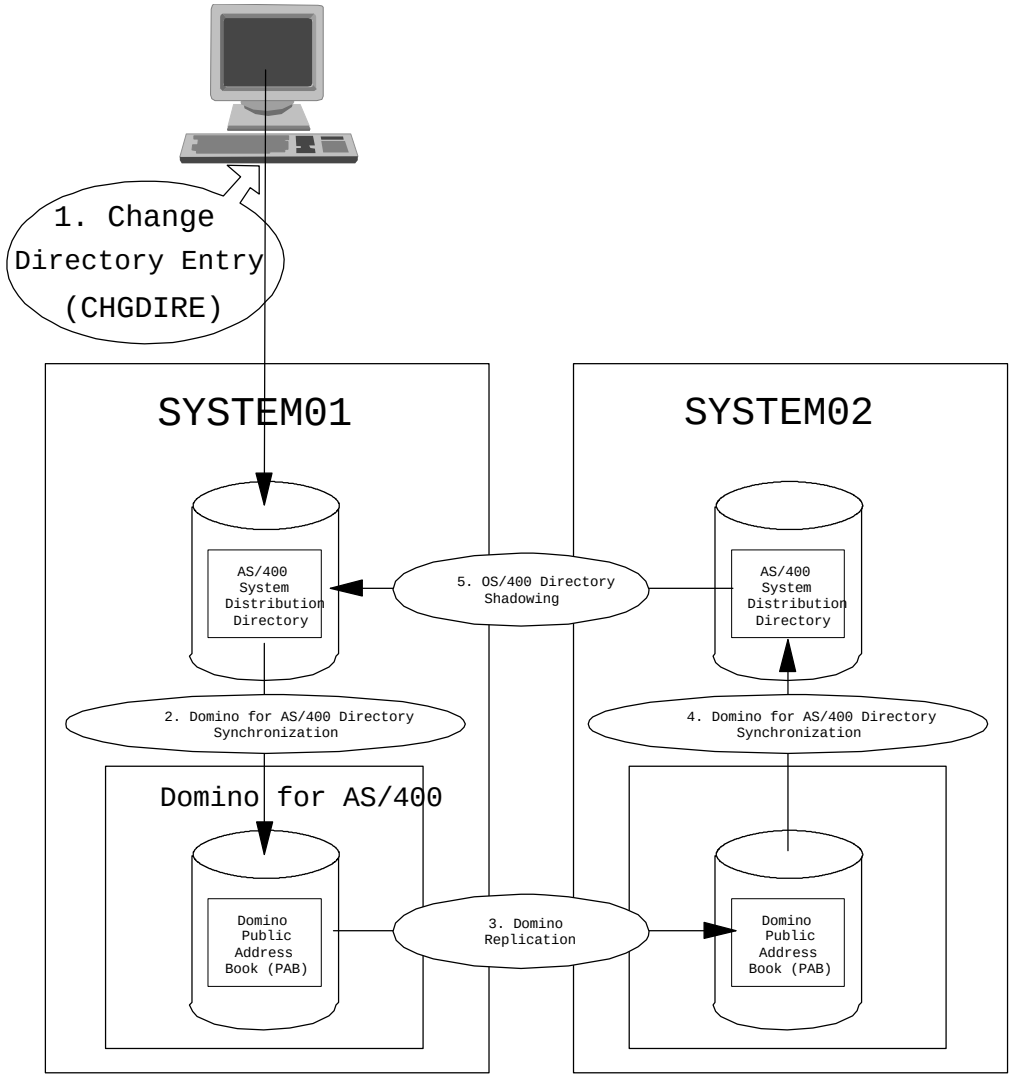


Figure 116. Loop Situation for Directory Synchronization and Shadowing

To avoid the possibility of endless updates, make sure not to setup your network in a closed loop. For example, disabling directory synchronization in SYSTEM02 would solve the problem in our example scenario.

Questions and Answers

Q: What happens if there are two different user entries with the same key fields in each of the directories (one in PAB, one in SDD) before you enabled configuration?

- For unidirectional synchronization: A synchronization will occur and the fields from the source directory will be copied to the fields of the entry in the target directory.
- For bi-directional synchronization: The master directory will copy its entries to the other directory first. The additional entries from the second directory are then copied to the master directory.

Q: What happens if you delete a key field value entry after population?

Because the key field no longer produces a value, the change is not reflected in the other directory. A value must exist in every key field to be synchronized with the other directory.

Problem Determination

Below is a list of four places to check for synchronization problems:

- The Notes database for directory synchronization logging information (NNDILOG.NSF), which is located on the Domino Server.

  Go to **File - Database - Open**, select the server, and specify **NNDILOG.NSF** in the Filename section.

- The spool files of AS/400 user QNOTES. The directory synchronization jobs and programs run under the QNOTES user profile. The synchronization jobs are named QNNDI2SD and QNNDI2NA.

  On any AS/400 command line, type the following:

  ```
  WRKSPLF QNOTES
  ```

  Accordingly, look for spool files of User Data type QNNDI2SD or QNNDI2NA.

- The OS/400 message queue QNNDIMSG is used to log messages from the OS/400 directory synchronization programs.

  On any AS/400 command line, type the following

  ```
  DSPMSG QNNDIMSG
  ```

- The OS/400 message queue QSYSOPR may be checked for severe errors.

  On any AS/400 command line, type the following:

  ```
  DSPMSG QSYSOPR
  ```

During normal processing, all messages are logged in the Notes Logging database (NNDILOG.NSF) only. For severe errors, messages are logged in NNDILOG.NSF and/or in the OS/400 message queue QSYSOPR. The OS/400 message queue QNNDIMSG is an intermediary for logging to the Notes Database NNDILOG.NSF. The OS/400 directory synchronization programs log messages to QNNDIMSG. A batch job transfers these messages to the Notes database NNDILOG.NSF and then deletes the messages from QNNDIMSG afterwards. If, for some reason, the batch job cannot process the messages from the message queue (batch jobs end, etc.), the messages remain on the message queue. In errors where jobs end, messages are logged to the Notes databases NNDILOG.NSF and QSYSOPR.

Chapter 6
The Graphical User Interface of Operations Navigator

AS/400 Operations Navigator is a powerful user graphical interface for Windows 95 and Windows NT clients that allows you to manage and administer your AS/400 systems using a graphical user interface very similar to Windows 95/NT. It is included with AS/400 Client Access.

AS/400 Operations Navigator for Domino is a separately installed sub-component for Operations Navigator that allows you to:

- Create (set up) Domino servers on your AS/400 system.
- Access the NOTES.INI file and other server properties.
- Modify the NOTES.INI file of the Domino servers on your AS/400 system.
- Start and stop Domino for AS/400 servers.
- Access the Domino administration panel.
- Register Notes users.

This chapter describes how you prepare a Windows 95 or Windows NT workstation and use Operations Navigator for Domino to set up and manage one or more Domino for AS/400 servers on one or more AS/400 systems.

Setting Up a Workstation for Operations Navigator for Domino

Before you can use set up a workstation to create and manage Domino for AS/400 servers, you must install Domino for AS/400 on your AS/400 system. If you did not install Domino for AS/400 yet, refer to Chapter 2 in this book on how to use the *Load and Run* (LODRUN) command to install the software. The LODRUN command must be started from a 5250 terminal or a 5250 emulation window.

Installing Client Access, Operations Navigator and Domino Plug-In

The prerequisite for the Operations Navigator for Domino, Client Access for Windows 95/NT, and the base support for Operations Navigator, can be installed from a CD-ROM or a network server; the plug-in for Domino *must* be downloaded from a managing AS/400 system. Use the following procedure to add Operations Navigator to your Notes administrator workstation.

Language Requirements for Using Operations Navigator

To use the Operations Navigator support of Domino for AS/400, make sure the national language version (NLV) of Client Access for AS/400 matches the NLV of Domino for AS/400. The same Client Access NLV must be installed on both the AS/400 host and the client workstation.

To determine if the NLV of Client Access on AS/400 matches the NLV of Domino for AS/400:

1. Enter the following AS/400 CL command:
   ```
   dspsfwrsc
   ```
2. Press **F11** to display the libraries and releases.
3. Verify that the value listed for the Feature of 5769LNT Option **1** with a Feature Type of *LNG matches the value listed for the Feature of the IBM licensed product 5763-XD1 with a Feature Type of *LNG.

Note Secondary languages for 5763-XD1 must be installed from a separate CD-ROM.

To determine the languages that are available on the client, use Windows Explorer to view subdirectories of the Client Access installation. Find the Client Access directory and verify there is a subdirectory MRIxxxx where xxxx matches the NLV of Domino for AS/400.

You must use the matching NLV on the client when you run Domino for AS/400. To select a national language for the client, select Client Access Properties in the IBM AS/400 Client Access program group and then click the Language tab. To install available secondary languages on the client, use Selective Setup in the Accessories folder of the IBM AS400 Client Access program group.

Installing AS/400 Client Access for Windows 95/NT on your Workstation

1. Install and set up Client Access support on your AS/400 and workstation. For more information about Client Access, see one of the following:
   - *Getting Your AS/400 Working for You*, SC41-5161-01
   - *Client Access for Windows 95/NT-Setup*, SC41-3512-04 or later

     You can access these books from the AS/400 Online Library Web site at: http://as400bks.rochester.ibm.com
   - The *Welcome Center* CD that is provided with your AS/400 system
   - The AS/400 Technical Studio Web page at: http://www.as400.ibm.com/tstudio/ca400/caindex.htm

2. Double-click the *IBM AS/400 Client Access* icon (as shown in the following graphic) to open the *IBM AS/400 Client Access* folder.

Selecting the Correct Managing System

For the following steps it is important that the managing system for AS/400 Client Access is the AS/400 system that has Domino for AS/400 installed. Therefore you should check first to see if your Client Access workstation has a connection defined to the correct AS/400 system.

3. Double-click the *AS400 Connections* icon:

4. Verify that the name of your AS/400 system (which must have Domino for AS/400 installed) appears in the right pane of the folder. If it does not, click **Connection** and then **New** from the menu bar, and follow the instructions to define a new connection.
5. Right-click the icon representing your AS/400 system, and choose **Connect**. A dialog appears requesting a valid AS/400 user ID and password.
6. Close or minimize the *AS400 Connections* window and open the *IBM AS/400 Client Access* folder again.
7. Double-click the *Client Access Properties* icon:

8. Click the **Service** tab as shown in Figure 117.

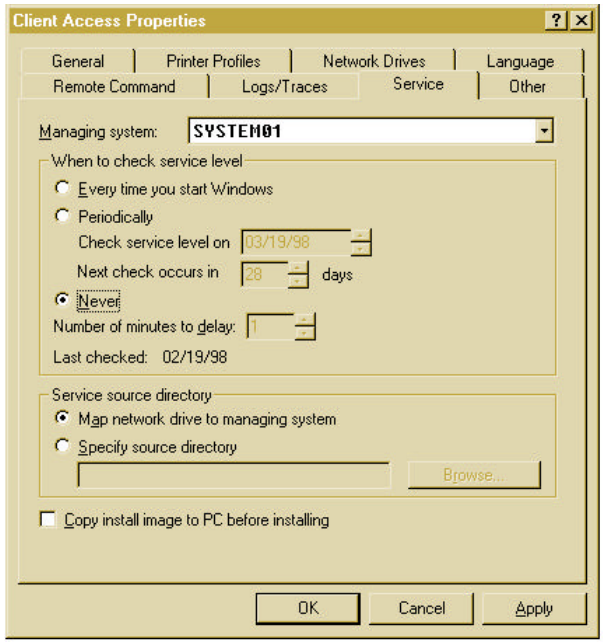


Figure 117. Define Managing System for Client Access Workstation

9. Select the name of your AS/400 system in the dialog box.
10. Click the **OK** button.

Installing the Domino for AS/400 Plug-In

Operations Navigator now needs to be extended with Domino for AS/400 support. Such an additional support function is called a "plug-in."

11. Double-click the *Accessories* icon to open the *Accessories* folder.
12. Double-click the *Selective Setup* icon.

The *Selective Setup* start dialog appears.

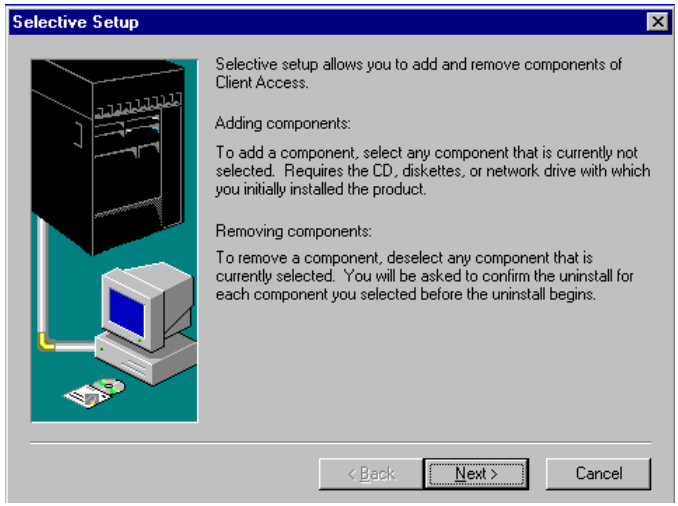

Selective Setup
Selective setup allows you to add and remove components of Client Access.
Adding components:
To add a component, select any component that is currently not selected. Requires the CD, diskettes, or network drive with which you initially installed the product.
Removing components:
To remove a component, deselect any component that is currently selected. You will be asked to confirm the uninstall for each component you selected before the uninstall begins.
< Back
Next >
Cancel

Figure 118. Selective Setup Start Dialog

13. Click the **Next** button.
14. In the *Setup Options* dialog (Figure 119) make sure to select *Use the managing system.*

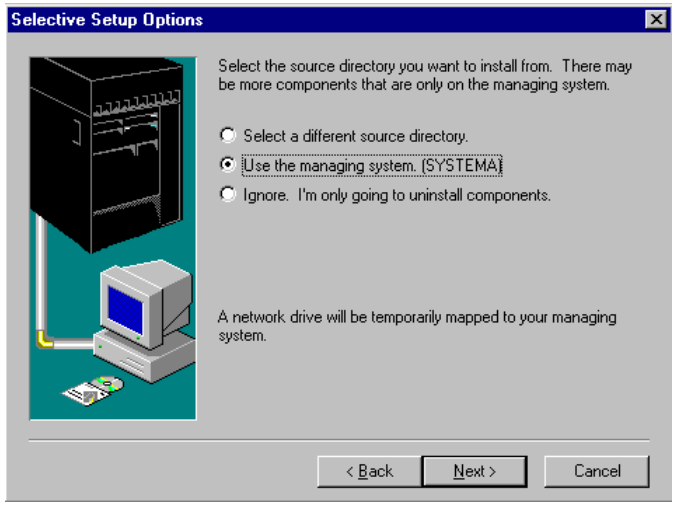

Selective Setup Options
Select the source directory you want to install from. There may be more components that are only on the managing system.
Select a different source directory.
Use the managing system. (SYSTEMA)
Ignore. I'm only going to uninstall components.
A network drive will be temporarily mapped to your managing system.
< Back
Next >
Cancel

Figure 119. Selective Setup Options Window

Important The managing system must be an AS/400 system with Domino for AS/400 installed. The name of the managing system is shown in parentheses. If the name of your AS/400 system is not shown here, you need to cancel the selective setup and select a managing system in the Client Access Properties. Then start again with "Installing the Domino for AS/400 Plug-In" on page 218.

15. Click **Next**. The messages *"Accessing managing system"* and *"Checking for components available on managing system ..."* is shown. If you are not already signed on to your AS/400, you will see a dialog box asking for your AS/400 user profile and password to sign on to the AS/400 system.

16. In the *Component Selection* window, highlight **AS/400 Operations Navigator** and make sure a check mark is shown on the left as shown in Figure 120.

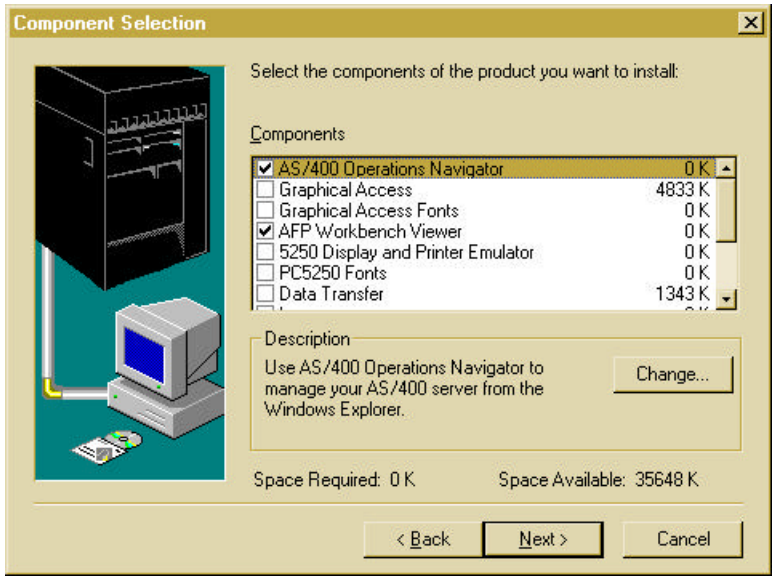

Component Selection
Select the components of the product you want to install:
Components
AS/400 Operations Navigator 0 K
Graphical Access 4833 K
Graphical Access Fonts 0 K
AFP Workbench Viewer 0 K
5250 Display and Printer Emulator 0 K
PC5250 Fonts 0 K
Data Transfer 1343 K
Description
Use AS/400 Operations Navigator to manage your AS/400 server from the Windows Explorer.
Change...
Space Required: 0 K
Space Available: 35648 K
< Back
Next >
Cancel

Figure 120: Component Selection Window

17. Click the **Change** button. Even if you already have Operations Navigator installed, you still need to click the **Change** button to add the sub-component

(plug-in) for Lotus Domino.

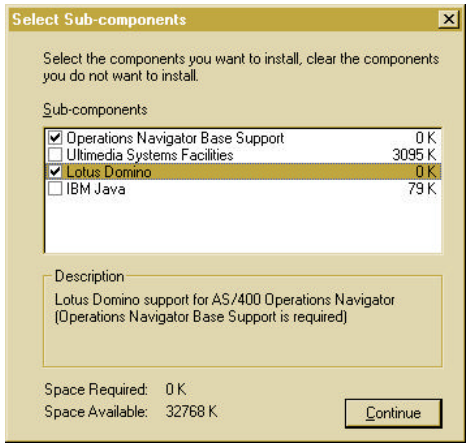

Select Sub-components
Select the components you want to install, clear the components you do not want to install.
Sub-components
Operations Navigator Base Support 0 K
Ultimedia Systems Facilities 3095 K
Lotus Domino 0 K
IBM Java 79 K
Description
Lotus Domino support for AS/400 Operations Navigator (Operations Navigator Base Support is required)
Space Required: 0 K
Space Available: 32768 K
Continue

Figure 121. Select Sub-components dialog box

18. In the *Select Sub-components* dialog box, select **Lotus Domino**as shown in Figure 121.
19. Click **Continue**.
20. In the *Component Selection* window, click **Next**.
21. In the *Start Copying Files* window, click **Next**.
22. In the *Install Completed window,* you may deselect *View the README file* and *Add program folder shortcut to desktop* options. Click **Next**.
23. From the *Setup Complete* window, click *"Yes, I want to restart my computer now,"* then click **Finish**.

Note If you are installing Operations Navigator for the first time, reboot your workstation.

Verifying Operations Navigator for Domino on Your Workstation

After you have installed the Domino plug-in for Operations Navigator, you can verify that it was installed correctly. From your Windows 95 or Windows NT desktop, perform the following steps:

1. Double-click the *IBM AS/400 Client Access* icon.
2. The *IBM AS/400 Client Access* folder will open.

3. Double-click on the *AS400 Operations Navigator* icon.

You should see an *AS400 Operations Navigator* window similar to the one shown in Figure 122.

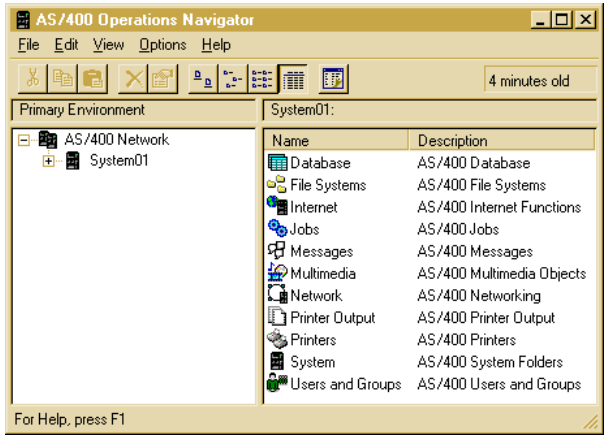


Figure 122. AS/400 Operations Navigator Initial Window

In the left panel of the window you should see the AS/400 the hierarchy tree of your AS/400 network with an icon at the top representing the entire AS/400 network, and one or more icons underneath for each AS/400 system.

4. Click the plus sign to the left of the icon representing your AS/400 system (the one which has Domino for AS/400 installed). The tree under the icon will be expanded to show the major system componentsof this AS/400 system.
5. Click the plus sign next to the *Network* icon (nderneath your AS/400 system to expand the network components of your AS/400 system.
6. Click the plus sign next to the Servers icon to see the servers branch of the tree.

7. Within the *Servers* branch of the hierarchy tree, you should see an icon named *Domino* as shown in Figure 123.

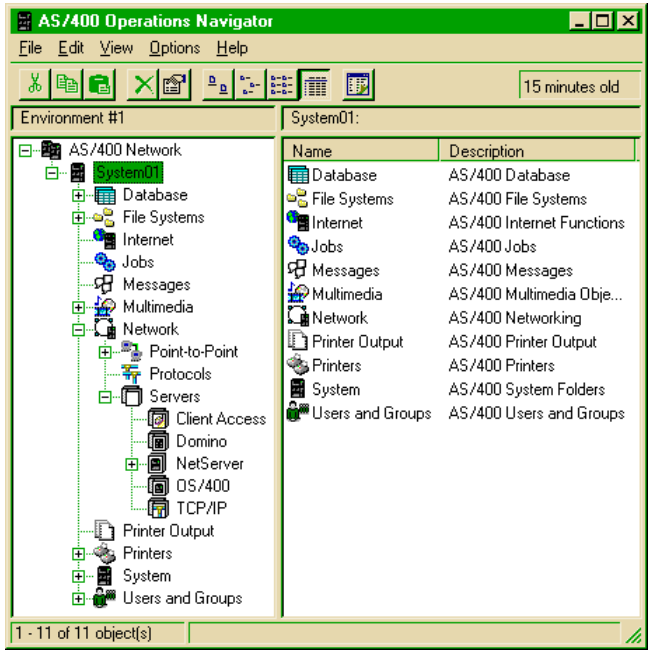


Figure 123. AS/400 Operations Navigator with Domino Icon

8. If you do not see an icon named Domino, do the following:
   - Right-click the icon on top for AS/400 Network and you will see a menu.
   - Click **AS/400 Objects** and you will see the "Select AS/400 Objects" dialog box shown in Figure 124.
   - Make sure that **All** is selected and then click on the **OK** button.

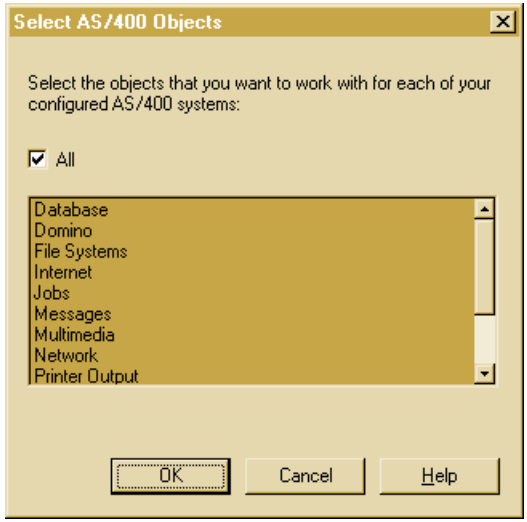


Figure 124. Select AS/400 Objects to be Used with Operations Navigator

9. If you still do not see the Domino icon, you may have encountered a software defect. Refer to "Domino Icon Not Showing in Navigator Window" on page 282 for more information.

10. Click the Domino icon. Depending on the speed of your connection and the model and utilization of your AS/400 system, it may take from a few seconds up to a minute until you see a response. In the meantime you see the AS/400 icon shown in Figure 125.

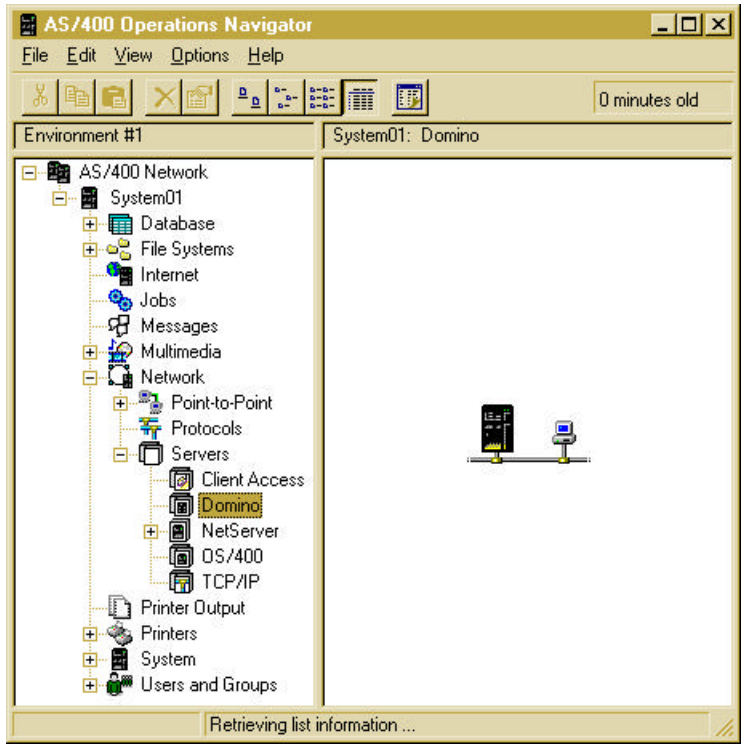


Figure 125. Building the List of Servers

11. If you did not configure any Domino for AS/400 servers yet, the right pane of the window will remain empty. Otherwise, for example if you already set up one or more servers using the AS/400 common interface, you see each Domino server on your AS/400 system represented by an icon along with its status (Stopped, Starting, Started, Unknown).

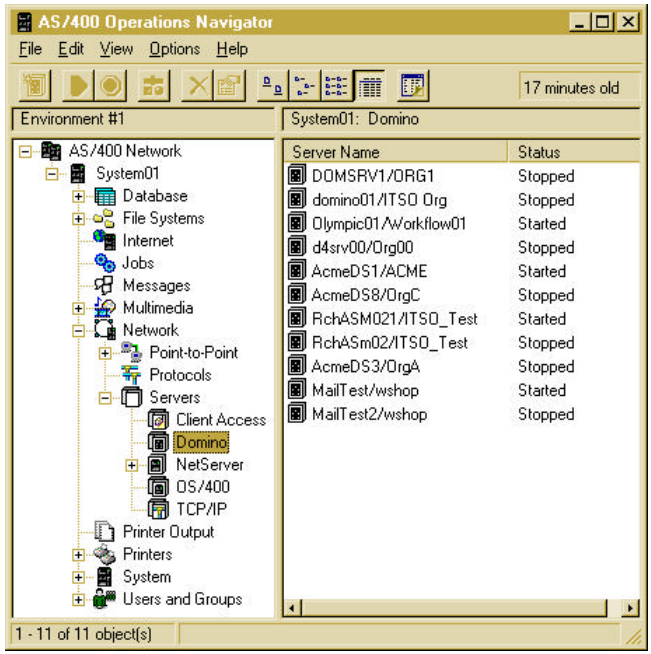


Figure 126. List of Domino for AS/400 Servers

At this point you are ready to use the Operations Navigator to configure or manage Domino for AS/400 servers. The sections that follow show what you can do with Operations Navigator.

Creating a New Domino for AS/400 Server

Once you have installed the Domino for AS/400 software on your AS/400 system (using a 5250 terminal or 5250 emulation session) and set up Operations Navigator and its Domino plug-ins, as described in the previous sections, you have to *create* at least one Domino server to use Lotus Domino for AS/400 . The terminology for this process varies. While the similar task for other Domino platforms is often called *setup*, it is called *configurati*on when you use an AS/400 CL command (as described in Chapter 2 of this book) and *create* when you use the graphical user interface of Operations Navigator as described in the sections that follow.

Overview

The basic concept for creating a new server using Operations Navigator is a two step process:

1. You enter all necessary parameters into a Notes configuration database
2. A job is submitted to the AS/400 for you to perform the configuration process.

The first step is very similar to setting up a Domino server for other platforms (such as OS/2, Windows NT, or UNIX) using the Domino Server Setup database (`SETUP.NSF`), which is new in Domino 4.6. Note, however, that even though the user interface is very similar, you cannot use the same database, and you have to start the process from the Operations Navigator as described in the following steps.

To be able to use this process, you need to have a Lotus Notes Designer client with the Designer license installed on your administration workstation.

Before You Start: Ensure Full Message Logging

The AS/400 Domino server setup program requests run under the QSYSWRK subsystem using pre-started jobs that are submitted using the QUSER user profile. AS/400 errors related to the setup function are written to QUSER job logs. These job logs are put in spooled output files on the AS/400. The job name for these spooled files is QZRCSRVS, which is the
job name associated with the pre-started jobs.

To to see the fully detailed messages resulting from the server setup program, change the job description to increase the logging level. You can use the *Change Job Description* (CHGJOBD) command to change the job description QZBSJOBD to have the following values for the maximum logging level. Enter the following command on any AS/400 command line:

```
CHGJOBD JOBD(QSYS/QZBSJOBD) LOG(4 00 *SECLVL)
```

Note The change does not take effect for jobs already running at this time. If you want to use the setup function immediately and ensure full message logging, you should change the active jobs, too. You can find those jobs by entering the following command:

```
WRKJOB JOB(QZRCSRVS)
```

Steps to Create a Server

The starting point for creating a new server is the Domino icon in the left pane of the Operations Navigator window (see Figure 125 on page 263).
To set up (configure, create) your Domino for AS/400 server, perform the following steps:

1. Right-click the Domino Icon and you will see a pull-down menu.

2. Select **New Domino Server**. The Notes client starts for you at this point, and you should see a form showing the first of 4 panels needed to enter the parameters for setting up a Domino for AS/400 server as shown in Figure 127.

   Tip Depending on your display size and settings, you may not see the complete form. If you need to scroll the window horizontally, choose **View - Show - Horizontal Scroll Bar**.

Most of the parameters to be entered are the same as the ones used for the *Configure Domino Server* (CFGDOMSVR) command explained in Chapter 2 of this book. Some differences exist in the sequence and the form in which the parameters have to be entered. The Operations Navigator setup also provides a "Quick and Easy Setup" with a limited number of parameters to be entered. Only the "Advanced Setup" gives you the capability to enter all the possible parameters.

Note You must select "Advanced Setup" to create partitioned or clustered servers.

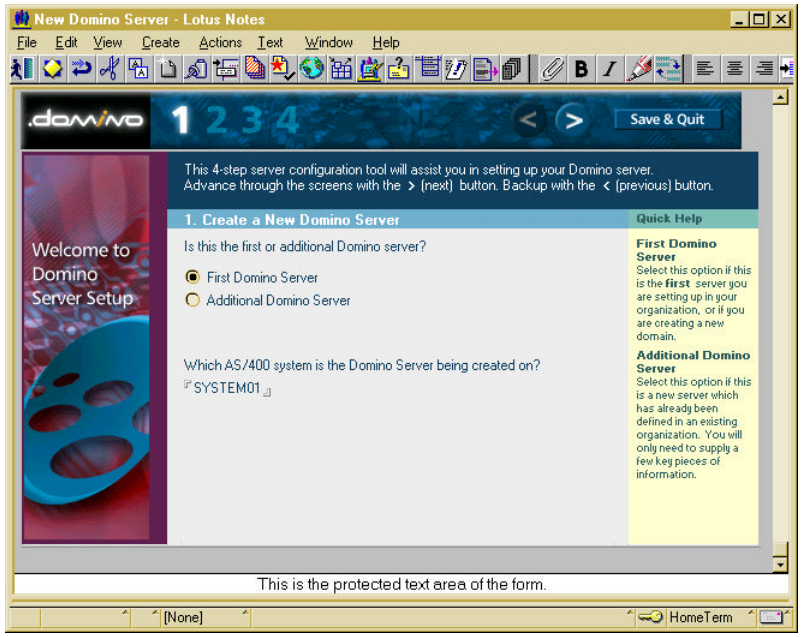

New Domino Server - Lotus Notes
File Edit View Create Actions Text Window Help
.domino
1 2 3 4
Save & Quit
This 4-step server configuration tool will assist you in setting up your Domino server.
Advance through the screens with the > (next) button. Backup with the < (previous) button.
Welcome to Domino Server Setup
1. Create a New Domino Server
Quick Help
Is this the first or additional Domino server?
First Domino Server
Additional Domino Server
First Domino Server
Select this option if this is the first server you are setting up in your organization, or if you are creating a new domain.
Additional Domino Server
Select this option if this is a new server which has already been defined in an existing organization. You will only need to supply a few key pieces of information.
Which AS/400 system is the Domino Server being created on?
SYSTEM01
This is the protected text area of the form.
[None]
HomeTerm

Figure 127. Set Up Domino for AS/400 Panel 1

3. Select "*First Domino Server*" to create a new Notes organization, or "*Additional Domino Server*" to create a new Domino server in an existing Domino domain.

   Important Remember, if you want to set up an additional server, you first need to register the new server in the existing Public Address Book.

Note See “Configure an Additional Server in an Existing Domino Domain” in Chapter 2 of this book for more information on setting up additional servers.

4. Type the name of the AS/400 system where the Domino server should be created into the second field of the first panel.

5. Click the button with the “greater than” (>) sign. You will see the second configuration panel.

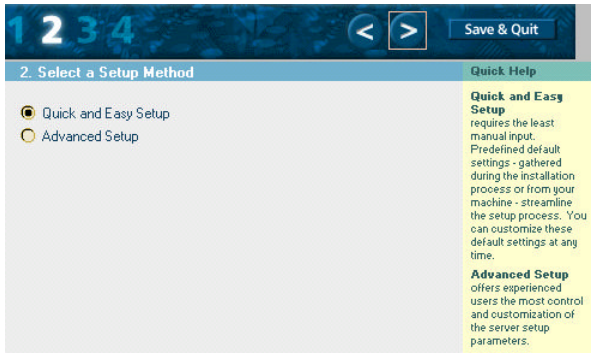

1 2 3 4
Save & Quit
2. Select a Setup Method
Quick Help
Quick and Easy Setup
Advanced Setup
Quick and Easy Setup
requires the least manual input. Predefined default settings - gathered during the installation process or from your machine - streamline the setup process. You can customize these default settings at any time.
Advanced Setup
offers experienced users the most control and customization of the server setup parameters.

Figure 128. Set Up Domino for AS/400 Panel 2

6. The only choice you have in this panel is to select the “Quick and Easy Setup” with a limited number of possible parameters, or the “Advanced Setup” providing all possible settings. In the following steps, we show the “Quick and Easy Setup” and later in the section we show the “Advanced Setup” (page 270).

7. Click the button with the “greater than” sign and you will see the third configuration panel.

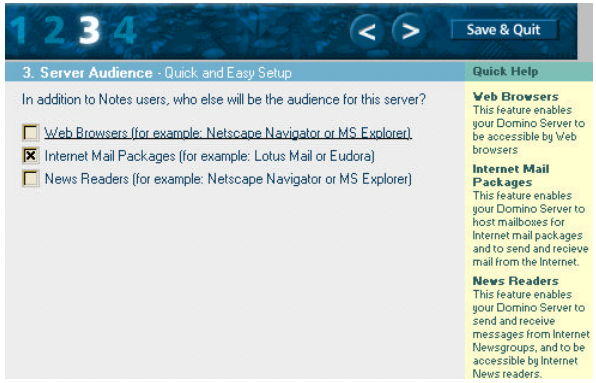

1 2 3 4
Save & Quit
3. Server Audience - Quick and Easy Setup
Quick Help
In addition to Notes users, who else will be the audience for this server?
Web Browsers (for example: Netscape Navigator or MS Explorer)
Internet Mail Packages (for example: Lotus Mail or Eudora)
News Readers (for example: Netscape Navigator or MS Explorer)
Web Browsers
This feature enables your Domino Server to be accessible by Web browsers
Internet Mail Packages
This feature enables your Domino Server to host mailboxes for Internet mail packages and to send and recieve mail from the Internet.
News Readers
This feature enables your Domino Server to send and receive messages from Internet Newsgroups, and to be accessible by Internet News readers.

Figure 129. Set Up Domino for AS/400 Panel 3 for Quick and Easy Setup

8. For the “Quick and Easy Setup” you see only 3 check boxes in panel 3, which means:

- You cannot set up any of the advanced services such as partitioned servers, clusters, or billing.
- Checking Internet Mail Packages selects all of the following:
  - IMAP
  - LDAP
  - POP3
  - SMTP/MTA

9. Click the button with the “greater than” sign and you will see the fourth configuration panel.

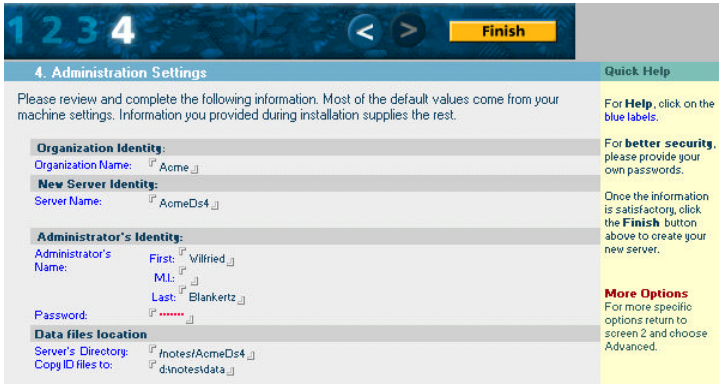

1 2 3 4
Finish
4. Administration Settings
Quick Help
Please review and complete the following information. Most of the default values come from your machine settings. Information you provided during installation supplies the rest.
Organization Identity:
Organization Name: Acme
New Server Identity:
Server Name: AcmeDs4
Administrator's Identity:
Administrator's Name:
First: Wilfried
M.I:
Last: Blankertz
Password:
Data files location
Server's Directory: /notes/AcmeDs4
Copy ID files to: d:\notes\data
For Help, click on the blue labels.
For better security, please provide your own passwords.
Once the information is satisfactory, click the Finish button above to create your new server.
More Options
For more specific options return to screen 2 and choose Advanced.

Figure 130. Set Up Domino for AS/400 Panel 4 for Quick and Easy Setup

10. Refer to the description of the fields ***Organization***, ***Server Name*** and ***Administrator’s Name*** in Chapter 2 of this book.

The field ***Server’s Directory*** specifies the data directory within the AS/400 Integrated Files System (IFS), to be used to store all the Notes databases for this server.

If you want to have the server and administrator ID files as well as the certifier ID file for the new server copied to your workstation disk, you need to specify a path in the field ***Copy ID files to:***. Make sure this path exists, it will not be created for you.

11. Click **Finish** and after responding to the Continue? message box (Figure 131), the configuration job will be submitted to your AS/400 system. If you made no mistakes, you will see a success message (see Figure 136 on page 273) after 5 to 20 minutes, depending on the size

and utilization of your AS/400 system.

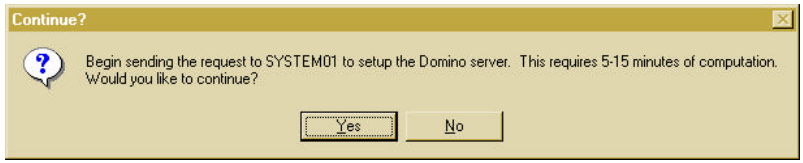

Continue?
Begin sending the request to SYSTEM01 to setup the Domino server. This requires 5-15 minutes of computation. Would you like to continue?
Yes
No

Figure 131. Continue?

Our example, however, guides you through the case where mistakes have been made and you receive the following message:

Figure 132. Errors Occurred in Command

12. After you click **OK,** you see a more meaningful message:

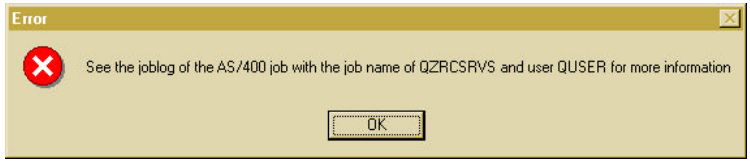


Figure 133. Error - See Joblog

This message still does not tell you the exact reason why the server could not be configured, but we get some clues on the job name (QZRCSRVS) and user name (QUSER) to search for more information. To do so, you can use the Operations Navigator or an AS/400 CL command from a 5250 session. In our example, we show how to use Operations Navigator.

The job you have to look at has already ended, and the job log should exist as a spool file.

13. In the left pane of the Operations Navigator window, click the icon named *Printer Output*. In the right pane, you will see spool files created by your user ID. However, the configuration job ran under the profile QUSER[1]. Therefore you have to look at other job logs. To do so, click **Options - Include** and you will see the *Include* dialog box. Type the following values:

User:	**QUSER**
User-specified data:	**QZRCSRVS**

[1] Even though the job runs under QUSER, it adopts the authorities of the user profile you used to sign on to Client Access.

Then click **OK**. You will see a list of spool files. If you don't see any spool files with the specified selection criteria, you should refer to the instructions given in "Before You Start: Ensure Full Message Logging" on page 265. Also make sure that your user profile has the special authorities *All Object* (*ALLOBJ).

In the list of spool files, search for the correct one according to the time stamp when it was created. Having found the correct one, you can double-click to display its contents. There may be many messages and you have to search for a cause of the problem. Here is one example:

```
30    07/09/98   15:39:48   QNNINVAL       QNOTES      *STMT    QZRCSRVS     QIW
  From module . . . . . :   QNNINVAL
  From procedure  . . . . . :   Send_Message__FPcT1i
  Statement . . . . . :   288
  To module . . . . . :   QZRCRMTC
  To procedure  . . . . . :   RunCommand
  Statement . . . . . :   50
  Message . . . . :   Maximum number of servers exceeded.
  Cause . . . . . :   You can have only one non-partitioned server or up to  16
    partitioned servers on your system. Recovery  . . . :   You must remove an
    existing server before installing a new one.
```

Figure 134. Maximum Number of Servers Exceeded

This message appears, if there is already a Server configured and either the existing or the new server (or both) were not defined as a partitioned server.

Since we used the "Quick and Easy Setup" in our example, it is obvious that the newer server was not defined as a partitioned server. In order to select any of the advanced services, such as partitions, you need to use the "Advanced Setup". Therefore, the solution for this problem is to repeat the configuration, this time selecting "Advanced Setup" in panel 2, and then partitions in panel 3 (assuming that the existing server was already set up as a partitioned server - otherwise it needs to be reconfigured too).

14. Click the button with the "less than" sign (<) to return to panel 3.
15. In panel 3, click the "less than" sign (<) to return to panel 2.
16. In panel 2, click **Advanced Setup**.

17. Click the “greater than” sign and you see the third configuration panel (Figure 135), now with more parameters than before (Figure 129 on page 268).

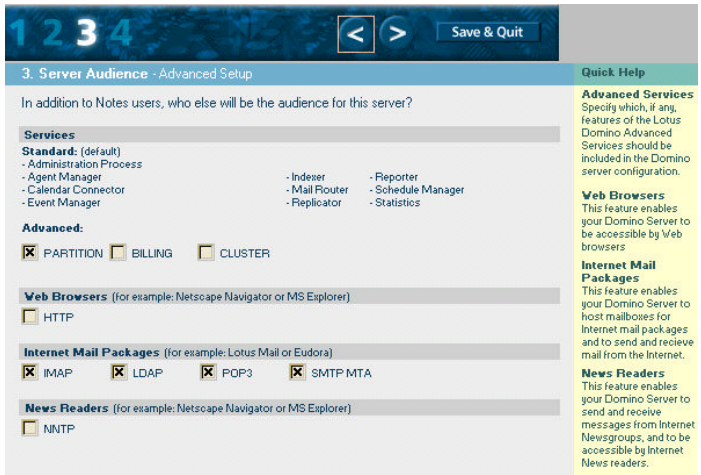

1 2 3 4
Save & Quit
3. Server Audience - Advanced Setup
In addition to Notes users, who else will be the audience for this server?
Services
Standard: (default)
- Administration Process
- Agent Manager
- Calendar Connector
- Event Manager
- Indexer
- Mail Router
- Replicator
- Reporter
- Schedule Manager
- Statistics
Advanced:
PARTITION
BILLING
CLUSTER
Web Browsers (for example: Netscape Navigator or MS Explorer)
HTTP
Internet Mail Packages (for example: Lotus Mail or Eudora)
IMAP
LDAP
POP3
SMTP MTA
News Readers (for example: Netscape Navigator or MS Explorer)
NNTP
Quick Help
Advanced Services
Specify which, if any, features of the Lotus Domino Advanced Services should be included in the Domino server configuration.
Web Browsers
This feature enables your Domino Server to be accessible by Web browsers
Internet Mail Packages
This feature enables your Domino Server to host mailboxes for Internet mail packages and to send and recieve mail from the Internet.
News Readers
This feature enables your Domino Server to send and receive messages from Internet Newsgroups, and to be accessible by Internet News readers.

Figure 135. Set Up Domino for AS/400 Panel 3 for Advanced Setup

18. This is the only way to select partitioned server, clustering, or billing. For our example, select *Partition* and click the “greater than” sign to continue to panel 4.

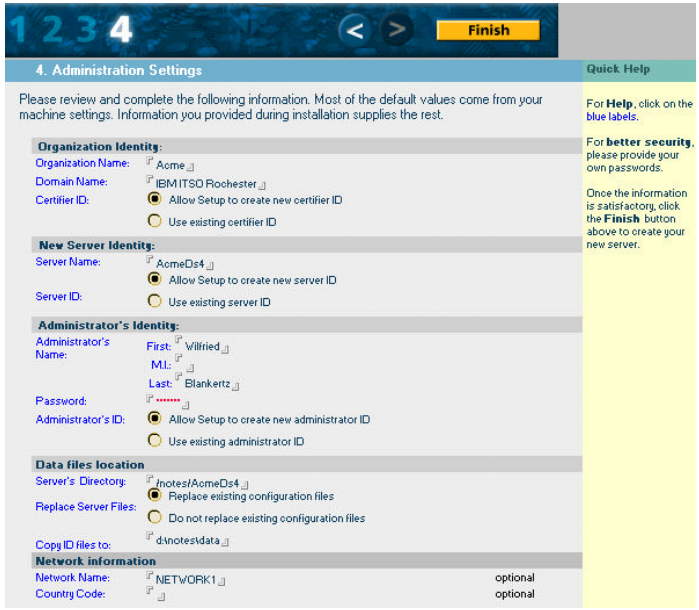

1 2 3 4
Finish
4. Administration Settings
Quick Help
Please review and complete the following information. Most of the default values come from your machine settings. Information you provided during installation supplies the rest.
For Help, click on the blue labels.
For better security, please provide your own passwords.
Once the information is satisfactory, click the Finish button above to create your new server.
Organization Identity:
Organization Name: Acme
Domain Name: IBM ITSO Rochester
Certifier ID: Allow Setup to create new certifier ID
Use existing certifier ID
New Server Identity:
Server Name: AcmeDs4
Server ID: Allow Setup to create new server ID
Use existing server ID
Administrator's Identity:
Administrator's Name: First: Willfried
M.I.:
Last: Blankertz
Password:
Administrator's ID: Allow Setup to create new administrator ID
Use existing administrator ID
Data files location
Server's Directory: /notes/AcmeDs4
Replace Server Files: Replace existing configuration files
Do not replace existing configuration files
Copy ID files to: d:\notes\data
Network information
Network Name: NETWORK1 optional
Country Code: optional

Figure 136. Set Up Domino for AS/400 Panel 4 Advanced Setup

19. Again, because you chose “Advanced Setup” in panel 2 (Figure 128), panel 4 shows more parameters than before. This time no changes are needed, and you can click the **Finish** button.

20. After 5 to 20 minutes, you see a panel reporting that the server was successfully created.

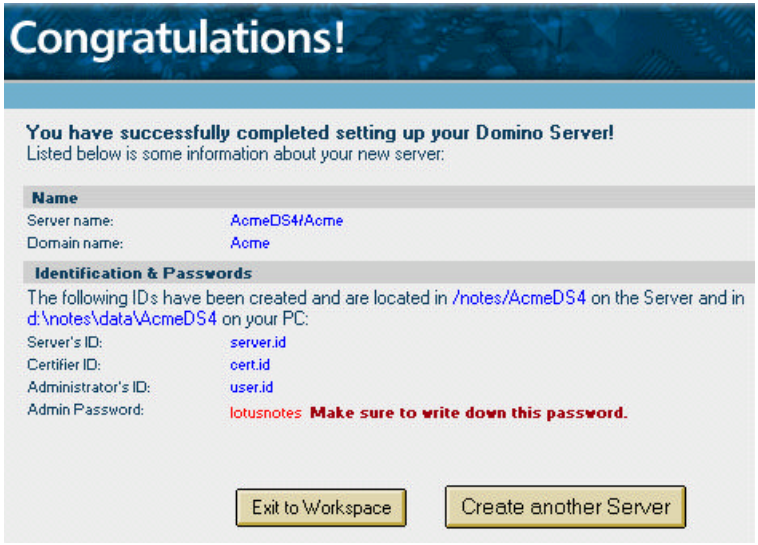

Congratulations!
You have successfully completed setting up your Domino Server!
Listed below is some information about your new server:
Name
Server name: AcmeDS4/Acme
Domain name: Acme
Identification & Passwords
The following IDs have been created and are located in /notes/AcmeDS4 on the Server and in d:\notes\data\AcmeDS4 on your PC:
Server's ID: server.id
Certifier ID: cert.id
Administrator's ID: user.id
Admin Password: lotusnotes Make sure to write down this password.
Exit to Workspace
Create another Server

Figure 136. Successful Setup of a Domino for AS/400 Server

Now when you switch to the AS/400 Operations Navigator window, you should see an icon representing your new server in the right pane. If you do not see it, choose **View - Refresh**. As the next step, you can exit to the workspace and start your server.

Deleting a Domino Server

If you right-click on a server icon and select **Delete**, you will delete the server. This is the equivalent of executing the *Configure Domino Server* (CFGDOMSVR) command with the option *REMOVE.

Note The entire data directory is deleted when you delete a Domino server.

See also Chapter 2 for information on removing a Domino server.

Starting and Stopping Domino Servers

After creating a Domino server through the graphical user interface of Operations Navigator, you can use also start or stop the server with the same interface. After you click the Domino icon in the left pane, you see all your servers in the right pane of the Operations Navigator window. To the right of each icon you can see the status of the server. The following table shows the possible states.

Status	*Meaning*
Stopped	All server tasks are stopped. The server is not active.
Start submitted	The request to start the server tasks was submitted.
Starting	The primary server tasks are beginning.
Started	The server is running.
Started and active	The server is running and can be accessed from a workstation.

If only the icons and names of each server appear, but not any status, you may have selected the wrong view (large icons, small icons, or list). To switch to the Details view, do one of the following:

- Click the toolbar icon showing a small table.
- Choose **View - Details** from the menu bar.

You may start or stop a server using one of the following methods:

- Right-click the icon, and then select **Start**, **Stop**, or **Stop Immediately** from the pull-down menu.
- Click once on the icon with the left mouse button and then the appropriate button on the toolbar:
  - To start a server, click the button with the green arrow.

  - To stop a server, click the button with the red symbol.

Administering a Domino Server

Operations Navigator allows you to perform several administrative tasks for the Domino for AS/400 servers:

- Show several important configuration parameters (properties) in one place
- Display or change the Domino initialization file (NOTES.INI)
- Launch the Notes administrative client

The following section describes briefly those tasks.

Displaying the Server Properties

To display the server properties, do one of the following:

- Double-click the server icon.
- Right-click the server icon and choose **Properties**.

- Click the server icon once with the left mouse button and then click this button.

If the server was not started or does not communicate, you will see the following message:

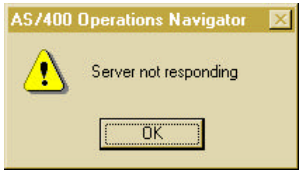


Figure 137. Server Not Responding

In such a case, you cannot see all of the property values. Click **OK** to continue.

You then see the server properties box. Three tabs show different aspects of the server properties.

Basics

This tab shows information such as the server name and title. If the server is not active, some of the information is displayed as "not available."

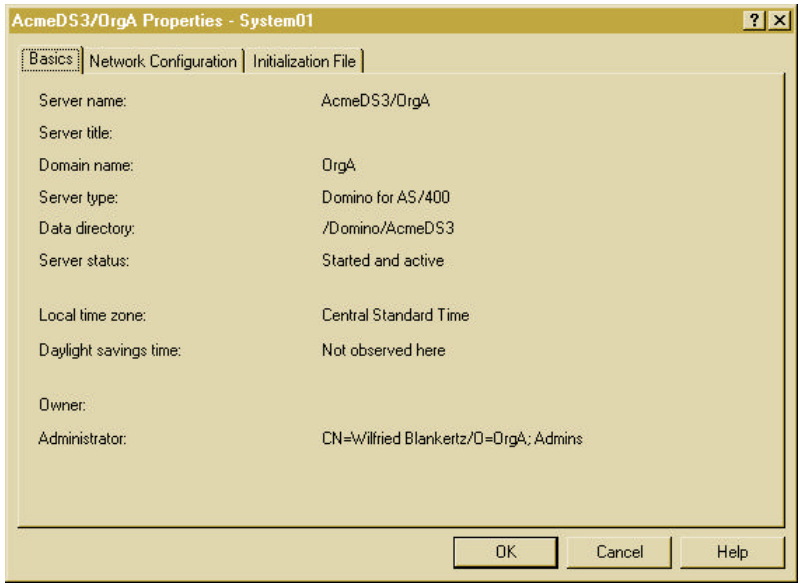


Figure 138. "Basics" Properties of Domino for AS/400 Server

Network Configuration

This tab shows network information for the server. The values on this page are set in the Public Address Book. You can only view this tab when the server is active.

The server's Public Address Book must also be available to view this information.

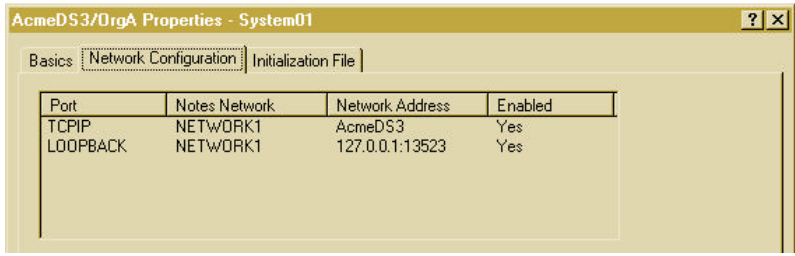


Figure 139. Network Configuration Properties of Domino for AS/400 Server

Displaying or Changing the Domino Initialization File (NOTES.INI)

This tab shows a copy of the NOTES.INI file that runs when you start this Domino server. The system creates this initialization file automatically when you set up the server.

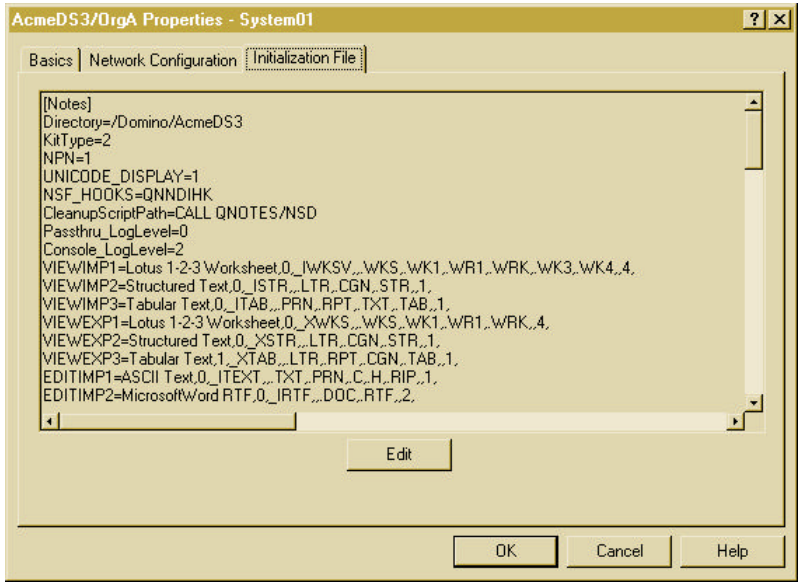


Figure 140. Initialization File

Click the **Edit** button to change the NOTES.INI file. If you do not see the Edit button, you cannot change the file.

Caution Changing the NOTES.INI file is recommended only for experienced administrators. Changes to the NOTES.INI file can introduce errors into the file and impair the operation of the Domino server. Make sure you want to change the file before continuing.

Tip When you click the **Edit** button, the Windows WordPad application will be called. If you receive an error message instead, WordPad may not be installed on your workstation.

Launching the Notes Administrative Client

To launch the Notes administrative client, do one of the following:

- Right-click the server icon and select **Server Administration**.
- Click once with the left mouse button and then click this button.

The Notes client on your workstation will be called and you will see the server administration dialog box.

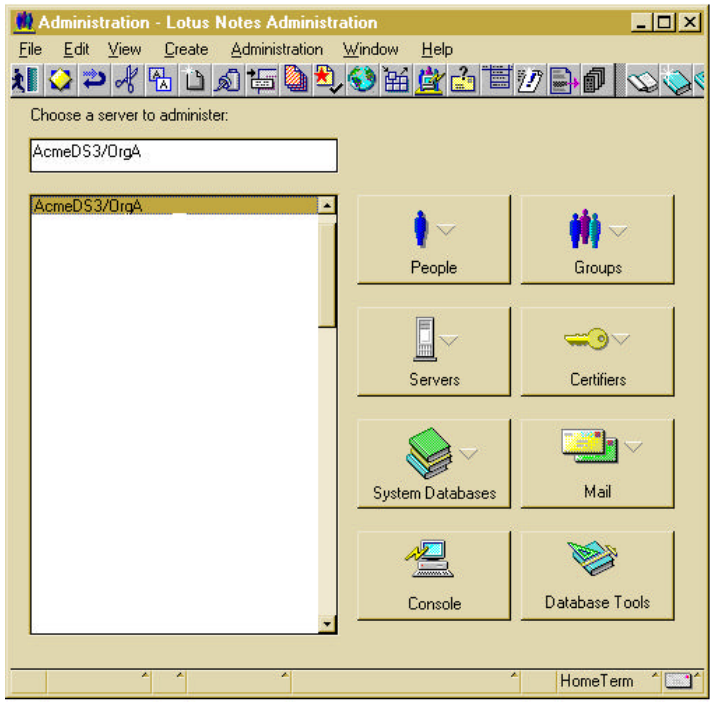


Figure 141. Server Administration

Registering a Notes User Based on an AS/400 User Profile

Operations Navigator allows you to manage all components of the AS/400 system. This includes creating, changing, grouping, and deleting AS/400 users, that is, *user profiles.*

The Operations Navigator extension to manage Domino servers also enhances your capability to manage users because you can register Notes user IDs at the same time when you create a new AS/400 user profile, or based on an existing AS/400 user profile.

Use the following steps to authorize an existing or new AS/400 user to use a Domino server.

1. In the AS/400 Operations Navigator, click the "+" icon next to Users and Groups in the left pane of the Navigator to expand this section.
2. Click All Users to view a list of all users.
3. You can either add an existing AS/400 user as a Domino user, or you can create a new AS/400 and Domino user at the same time:

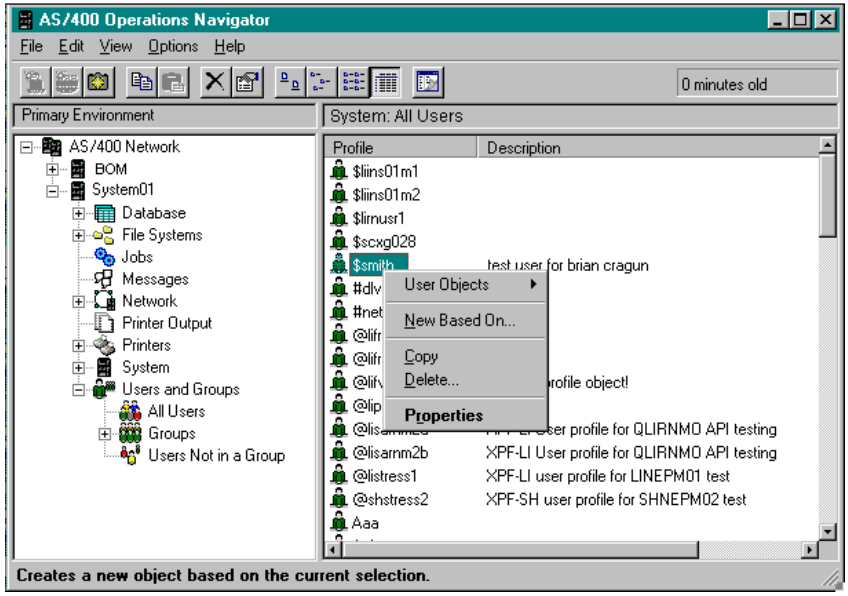


Figure 142. Selecting AS/400 User Profile

- To add an existing AS/400 user as a Domino user, double-click the user you want. This brings up the user's properties. (You can also use the right mouse button and select **Properties**.)
- To create a new AS/400 and Domino user at the same time, right-click All Users and then select **New User**.
- If the new user is similar to an existing user, it may be easier to right-click the existing user, and then choose **New Based On**.

This brings up the User Properties box (as in Figure 143) or the New User dialog box, which allows you to define an AS/400 group, as well as personal,

security, and job information. When you are ready to register, add the new user as a Domino server user, and proceed to the next step.

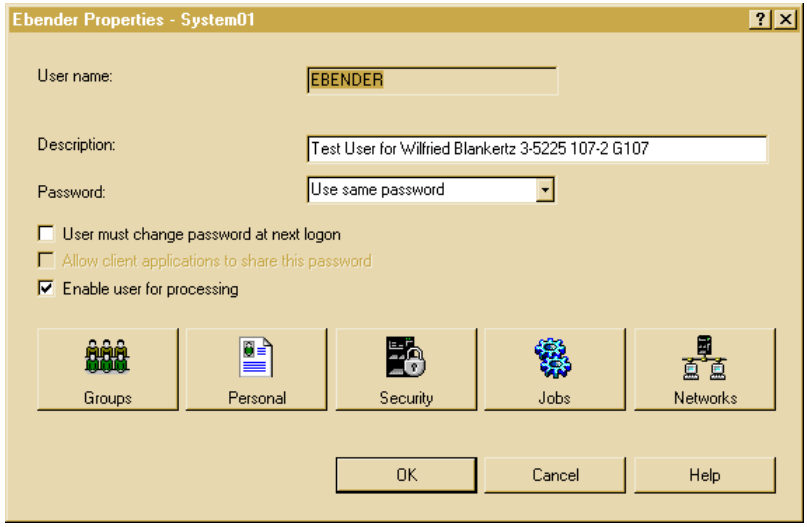


Figure 143. AS/400 User Properties

4. Click the **Networks** button and the *Networks* dialog box appears.

   Note The front page of the *Networks* dialog box showing the tab **Notes** is *not* the correct page to register a Notes user on the Domino for AS/400 server. This page allows you to register a Notes user on a server on the *Integrated PC Server*.

5. Click the **Domino Registration** tab.

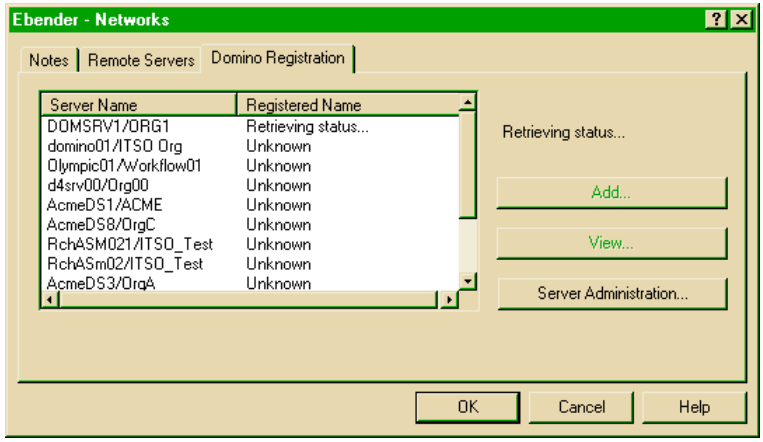


Figure 144. Networks Dialog

The registration automatically searches each of the servers for the name of the user you selected based on the existing personal information. The registrations display as they are found, one per line. In the list, the server name appears on the left and the user's registration name appears on the right. If you want to see registrations for the current user on a particular server immediately, double-click the server name. Searching starts on that server.

Tip If you are not currently signed onto the server, you will be prompted for your password. The dialog box asking for your password may be hidden by other boxes. On Windows 95, you may want to use the **Alt+Tab** keys to switch between windows and enter the password.

6. Select the server where you want to register the user.
7. Click the **Add** button and you will see the *Domino User Registration on ...* dialog box.

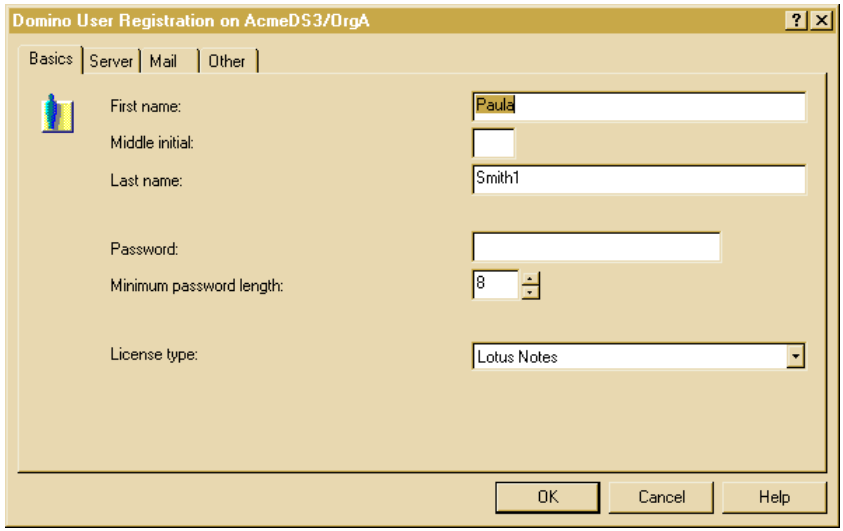


Figure 145. Domino User Registration on AcmeDS3

8. Click the tabs to enter the information required on each of the four pages.

   You must have the correct certified ID file on your workstation disk, diskette, or network drive, and you need to specify the full path name to access the file in the *Certifier ID* field on the **Server** page, along with the appropriate password.

   Caution The *Security Type* field on the **Server** page defaults to *North American*. You must change this to **International**, unless the North American license is installed on both the Domino for AS/400 server **and** the Notes Client.

The **Other** tab allows you to specify where to save the user ID file. The default is to attach it to the person document in the Public Address Book *and* store it on your diskette (A: drive).

Tip For help on filling in the required fields, click the **Help** button. For additional information, see the book *Planning the Domino System* or the *Domino Administration Help* database (helpadmn.nsf).

9. Click **OK** to complete the registration. Status messages display as the process continues, which can take up to three minutes.
10. A confirmation message appears to let you know that the user ID file has been created.
11. You can register the user on another server, or click **Cancel** to return to the Networks dialog box.
12. In the Networks dialog box, select **OK**. The main user dialog box displays.

Troubleshooting

This section contains a description of some common problems and tips on how to solve those problems.

Domino Icon Not Showing in Navigator Window

If you do not see the "Domino" icon under "Servers" after successfully installing the plug-in, this my be caused by a problem in the Windows 95 registry. To correct this, you have to follow these steps from the Windows 95 desktop:

1. Click **Start**.
2. Select **Run**.
3. Type **regedit** and click **OK**. The Registry Editor shown below appears.

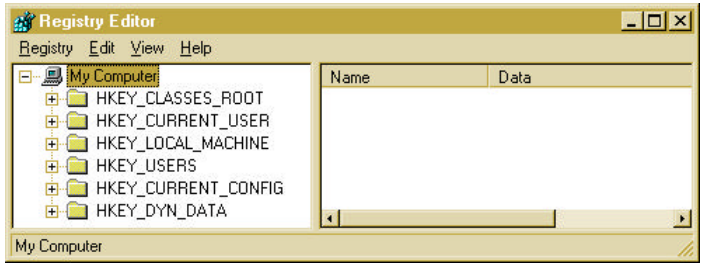


Figure 146. Registry Editor

4. Press **F3** (Find) and type the following search string:
   `Lotus.Domino`

5. Repeat the search by pressing **F3** until the complete path shown at the bottom of the window is:

   `My Computer\KEY_CLASSES_ROOT\IBM.AS.400.NETWORK\SYSTEMS\`
   `SYSTEM01`**`\Lotus.Domino`**

   (The string shown in the example above appears on a single line, where ***`SYSTEM01`*** is the name of your AS/400 system)

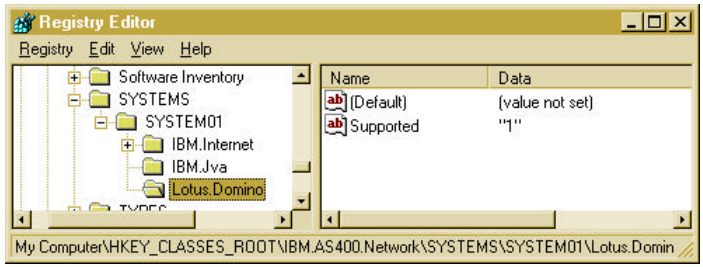


Figure 147. Registry Editor Window to Search for Lotus.Domino String

6. The right pane shows a value of *Supported*. Double-click *Supported* and change the value from 0 to 1.

Chapter 7
Dial-Up Connectivity

In many cases, you may want to connect a client or another server to your Domino for AS/400 server, where there is no Local Area Network (LAN) connection between the two systems. A solution for this is to use a remote dial-up connection over a switched telephone network. Since Domino for AS/400 supports only TCP/IP, this is done using the Point-to-Point Protocol (PPP) or the Serial Line Internet Protocol (SLIP). Support for both protocols is provided with the no charge AS/400 TCP/IP Utilities (5769-TC1) licensed product.

After providing some basic information on Domino dial-up connectivity, this chapter first describes how to configure the Domino server and a Notes client to connect over a switched line ("PPP Dial-In Example" on page 289) and later how to connect two servers using remote LAN services ("Server-to-Server Dial Connections with Remote LAN Service" on page 324).

Useful Publications

The following books are useful for setting up communications on your AS/400 system:

- *AS/400e series System Handbook, GA19-5486-17 (or a later edition)*
- *AS/400e series System Builder, SG24-2155-02 (or a later edition)*
- *Getting Your AS/400 Working for You*, SC41-5161
- *TCP/IP Configuration and Reference*, SC41-5420
- *Communications Configuration*, SC41-5401
- *AS/400 Client Access for Windows 95/NT - Setup V4R2*, SC41-3512-04

Changes in this Chapter

The following changes and additions have been made for the second edition of this redpaper:

On page 298: "Configuring the Remote PC Workstation for PPP Dial-in" contains more complete examples on how to set up a Windows 95 workstation to connect to a Lotus Domino for AS/400 server through a dial-up connection.

On page 324: "Server-to-Server Dial Connections with Remote LAN Service" explains how to set up the Lotus Domino for AS/400 server to initiate the dialing process to connect to another server for replication or mail routing using OS/400 Version 4 Release 2 or later.

Many minor corrections have been made in this chapter, therefore the changes are not marked.

Protocols for Lotus Domino for AS/400 Switched Line Support

There are two common scenarios with client dial-up:

- LAN-based connections and
- Host-based connections.

In the *LAN-based* scenario, a Notes workstation connects to an access point on a remote LAN and thereby gains access to IP resources on that remote LAN. This scenario allows a Notes workstation to have access to multiple IP-based Domino servers and hosts through a single connection.

In the *host-based* environment, a Notes workstation connects directly to a host through a single connection.

On some Domino platforms, the LAN-based scenario is accomplished using Remote LAN Service, while the host-based workstation connection is done with a proprietary protocol called X.PC.

With Domino for AS/400, PPP or SLIP is used in either case. Although access to IP resources other than the answering Domino server can be restricted, Lotus Domino for AS/400 and the Notes client behave as if a LAN-based IP connection would exist.

Other platforms may use a different Domino port for LAN-based versus direct dial communications. With Domino for AS/400, both LAN and WAN traffic may be accomplished using a single Domino port defined for the TCP/IP protocol.

Note Do not confuse Domino ports with TCP/IP ports. For example, port 80 is a TCP/IP port used to listen for HTTP requests. At least one named Domino port is defined for each configured protocol in the server document in the Public Address Book. The default name for the Domino port used for the TCP/IP protocol is `TCPIP`.

To use PPP or SLIP dial-up connections, the AS/400 system requires an appropriately configured communication adapter with a modem. If the client workstation is Windows 95, Dial-Up Networking capability is built in to the operating system, and Lotus Notes can take advantage of it.

The options for a dial-up connection are:

- A PPP connection using a PPP line description
- A SLIP connection using an asynchronous line description
- A SLIP connection using a PPP line description

A PPP connection always requires a PPP line description, while SLIP connection can use either a PPP or an asynchronous line description. A PPP line description can only be used in combination with a PPP capable communication adapter. For information about required hardware, see the section entitled "Prerequisites for Using PPP on an AS/400 System" on page 288.

An alternative to a direct connection between client and server is the use of an external dial concentrator to funnel multiple dial connections to one direct AS/400 LAN adapter. These devices may offer additional value in terms of routing capabilities and enhanced security options.

Two examples of supported dial concentrators are the IBM 2210 Nways Multiprotocol Router and the Digi PortServer II. When setting up such a device, two separate connections must be configured -- one between the client workstations and the dial concentrator, and the other between the dial concentrator and the AS/400.

Below are some guidelines for the basic configuration of PPP and SLIP connectivity types. This information is meant to be a roadmap based on test cases, not a comprehensive reference manual. For further details on PPP and SLIP, please refer to the *OS/400 TCP/IP Configuration and Reference V4R2*, SC41-5420-01 and *AS/400 Client Access for Windows 95/NT - Setup V4R2*, SC41-3512-04. These manuals are also available on the Web at:

`http://as400bks.rochester.ibm.com`

For more information about dial concentrator configuration, please refer to the documentation provided with the specific device.

As mentioned before, Domino for AS/400 supports PPP and SLIP for dial-up connections with Point-to-Point TCP/IP[1]. The following sections give a brief overview of those protocols.

What Is SLIP?

Serial Line Internet Protocol (SLIP) is the result of early attempts to connect two systems using TCP/IP over an asynchronous line. SLIP is a simple protocol for transmission of IP datagrams over serial lines, described in Request for Comment (RFC) 1055. SLIP has several deficiencies that are discussed in the RFC. Some of those deficiencies are as follows:

- No standardized mechanism for hosts to communicate addressing information
- No support for network protocols other than TCP/IP
- No support for system authentication
- No support for packet error detection, error correction, or compression

[1] The terminology may be somewhat confusing: Point-to-Point includes both PPP and SLIP, as well as switched and non-switched connections.

Despite these deficiencies, SLIP is still used today. It is provided as part of OS/400. IBM does not encourage use of SLIP. However, its support for an asynchronous line type allows the use of some of the older adapters and I/O processors with serial ports.

What is PPP?

Point-to-Point Protocol (PPP) addresses all of the SLIP deficiencies listed above, provides enhanced security, is more efficient, supports higher line speeds, and is easier to configure. One goal of PPP is to allow inter-operability among the remote access software of different manufacturers. Another goal is to allow the same physical communication line to be used by multiple network communication protocols.

Prerequisites for Using PPP on an AS/400 System

PPP is recommended over SLIP in environments that meet the following requirements:

- For PPP, you must use OS/400 Release 4 Version 2 (V4R2) or later. OS/400 Client Access and Operations Navigator under Windows 95/NT must also be enabled to allow the configuration of PPP connection profiles.
- A connection must be established using either a switched line or a direct leased line.
- The correct communication ports and adapters must be installed on the AS/400 system. PPP requires a special line description new to OS/400 V4R2, named PPP[2] as well. The PPP line description requires specific hardware and software. In order to use the PPP line description, your AS/400 system must have one of the following I/O adapters:
  - 2699 — Two-line WAN IOA[3]
  - 2720 — PCI WAN/Twinaxial IOA
  - 2721 — PCI Two-line WAN IOA

Which of the adapters can be installed depends on the model of AS/400 system you have. To find out more about AS/400 hardware requirements, refer to the *AS/400e series System Handbook*, GA19-5486-17 (or a later edition). More information on AS/400 support for Point-to-Point TCP/IP can be found in Chapter 4 of the book *AS/400e series TCP/IP Configuration and Reference Version 4*, SC41-5420-01.

For more information about remote connections for Domino, read "*Setting up a remote LAN server connection*" in Helpadmn.nsf or the book *Getting Started with Domino*.

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[2] The PPP line description supports SLIP connections as well as PPP connections.

[3] WAN = Wide Area Network; IOA = Input/Output Adapter

PPP Dial-In Example

This section guides you through the AS/400 configuration needed to allow a remote PPP client to connect to your AS/400 system. Beginning with OS/400 V4R2, you can create a new type of line description object, the PPP line description. This new line description must be used to establish a connection using PPP.

To use this PPP line description, your AS/400 system must have one of the I/O adapters described above. If you have a new AS/400 system or installed a new one in recent years, it is likely that one of these adapters is present. Appropriate modems and modem cables are also required. If you have not yet made an investment in modem hardware, it may be possible to use your AS/400 system's Electronic Customer Support (ECS) modem temporarily for testing purposes.

Once you have determined that your AS/400 system has the ability to establish a PPP connection with another system, you need to provide your AS/400 system with the information that allows it to do this. This information is called a connection profile.

PPP connection profiles are configured using Operations Navigator, a graphical interface to AS/400 network administration tasks. Operations Navigator uses the industry standard Windows Explorer interface and is a component of OS/400 Client Access for Windows 95/NT, which comes with the OS/400 operating system at no additional charge. No additional license fees are required to use Operations Navigator. It also offers convenient access to Domino administration from the same interface (automatically invoking the appropriate function of a Notes client under the covers) and the capability to edit the NOTES.INI configuration file of the Domino for AS/400 server.

Configuring the PPP Connection Profile on the AS/400 System

To set up a connection to the AS/400 system using the Operations Navigator, perform the following steps:

Note The figures in this example depict Operations Navigator Version 3 Release 1 Modification Level 3.

1. From the Windows 95 or Windows NT desktop, start Operations Navigator.
2. In the main tree of Operations Navigator, click the plus sign (+) next to the icon representing your **AS/400** system to expand the tree.
3. Click the plus sign (+) next to **Network**.
4. Click the plus sign (+) next to **Point-to-Point**.
5. Click **Connection Profiles**. You see the existing profiles in the right pane of the navigator as shown in Figure 148.

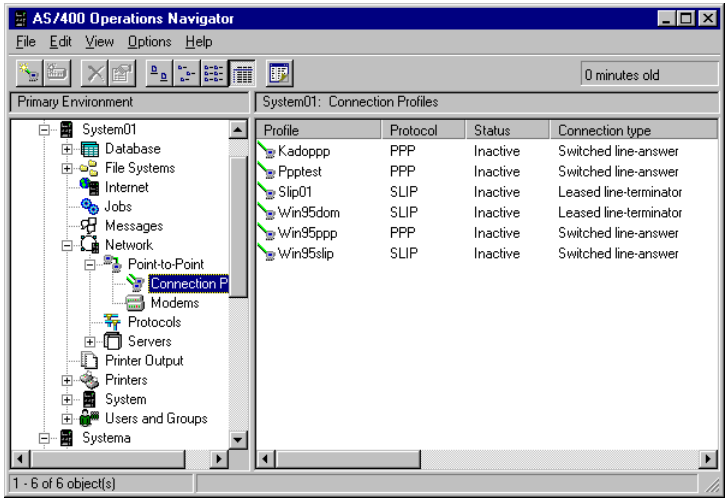

Figure 148. AS/400 Operations Navigator Window: Connection profiles

To check for existing Point-to-Point profiles, look for icons with the Protocol type PPP and a connection type of switched line-answer. If PPP line profiles exist, you can view them by right-clicking the individual names and selecting Properties from the resulting context menu.

Note If asynchronous line profiles exist, you can only start, stop, or delete these Point-to-Point profiles by right-clicking the individual names and selecting Start, Stop, or Delete from the resulting context menu.

Creating a New PPP Connection Profile

1. Right-click on **Connection Profiles** to open a context menu.
2. Choose **New Profile**. You will see the *Point-to-Point Profiles Properties* box with five tabs.
3. For the **General** tab, in our example we specified the following as shown in Figure 149:

   Profile Name: WIN95PPP
   Description: PPP Connection for Domino clients
   Type: PPP
   Mode: Switched line-answer

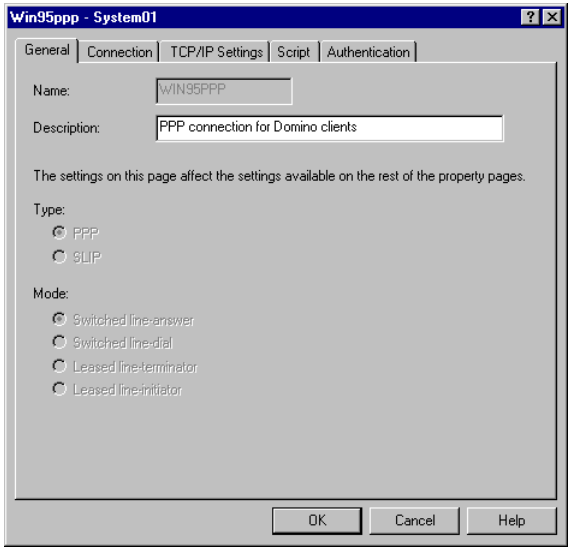

Figure 149. New Point-to-Point Profile Screen Using Operations Navigator

4. Click the **Connection** tab.

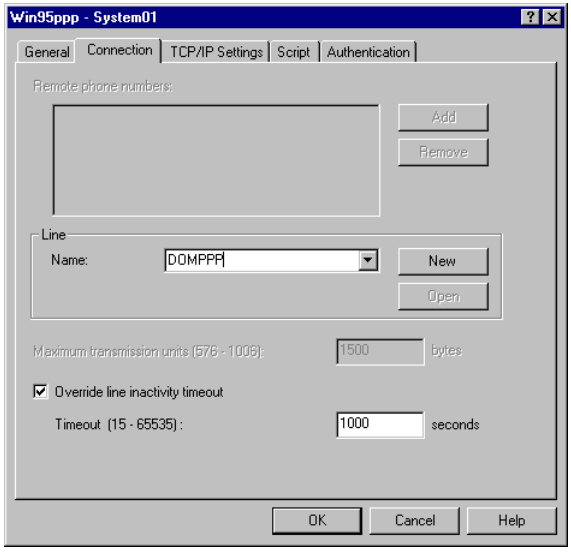

Figure 150. New Point-to-Point Profile Screen: Connection Tab

Specify a Name for the Line description. We used `DOMPPP` in our example.

Note If a PPP line description already exists, you may select it from the drop-down list.

If you wish to maintain the connection during a longer idle time period, you may specify an inactivity time-out value higher than the default of 15 seconds.

5. If you typed a new name for the line description, click the **New** button. A dialog box called *New Line Properties* will appear.

   If you selected an existing line description from the drop-down list, click the **Open** button instead. You will simply be referring to the next few steps to validate existing line properties instead of entering them for the first time. Any parameters may be modified except those on the **General** tab. If the **General** tab is not configured correctly, you must create a new line description.

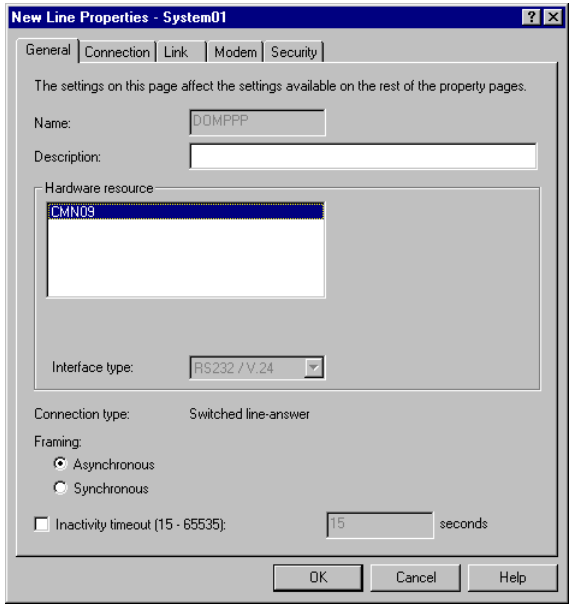

Figure 151. New Line Properties - General Tab

6. On the page with the General tab, select one of the listed Hardware resources. The Interface type must be **RS232/V.24**.

   The PPP protocol supports either synchronous or asynchronous framing, depending on your modem type and setup. Since framing type must be the same for both client and server, and asynchronous modems are typically more common with client workstations, our example uses **Asynchronous** framing.

   If you wish to keep the line active during a longer idle time period, you may specify an higher inactivity timeout value higher than the default of 15 seconds.

7. On the **Connection** tab, accept the default values as shown in Figure 152.

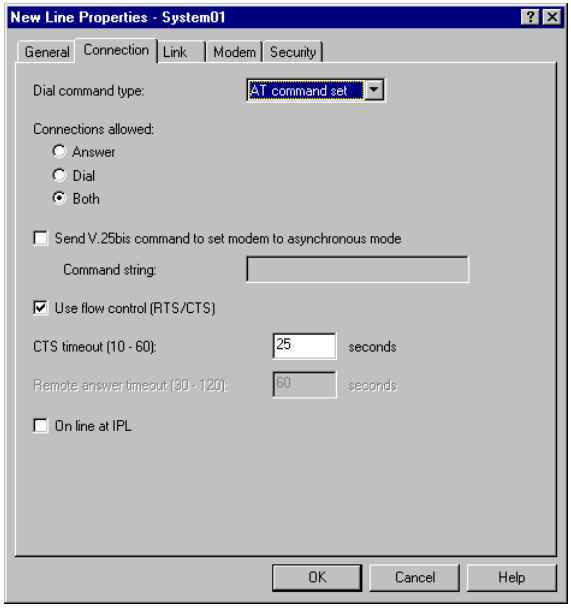

Figure 152. New Line Properties - Connection Tab

8. On the **Link** tab, specify the maximum line speed supported by your hardware.

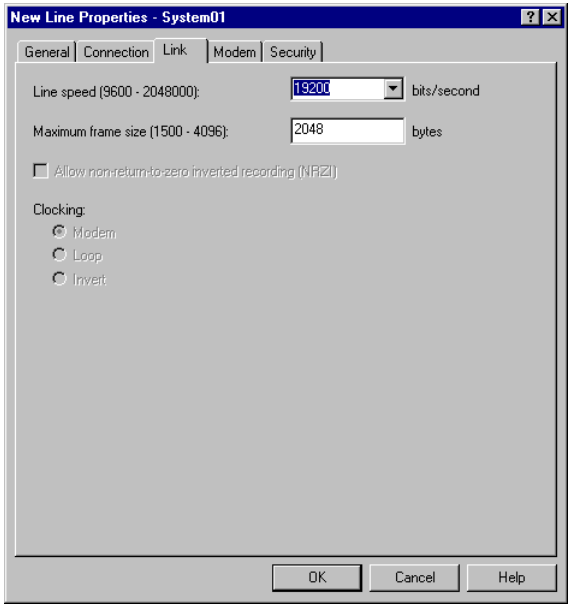

Figure 153. New Line Properties - Link Tab

9. Click the **Modem** tab and select the appropriate modem from the **Name** pull-down box. If you are using an IBM 7857-017 modem, a customized modem information entry may need to be created. Refer to “Special considerations with the 7857-017 modem“ on page 308 for details.

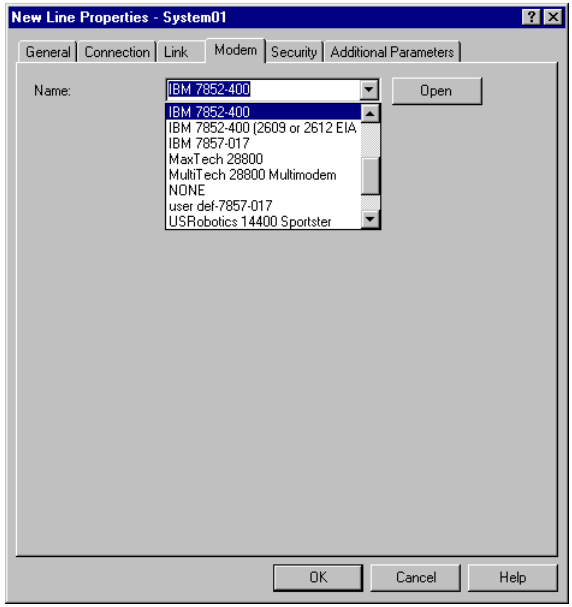

Figure 154. New Line Properties - Modem Tab

10. Click the **OK** button to close the *New Line Properties* box and return to the *Point-to-Point Profiles* Properties box.

11. Click the **TCP/IP Settings** tab, and fill in the necessary information.

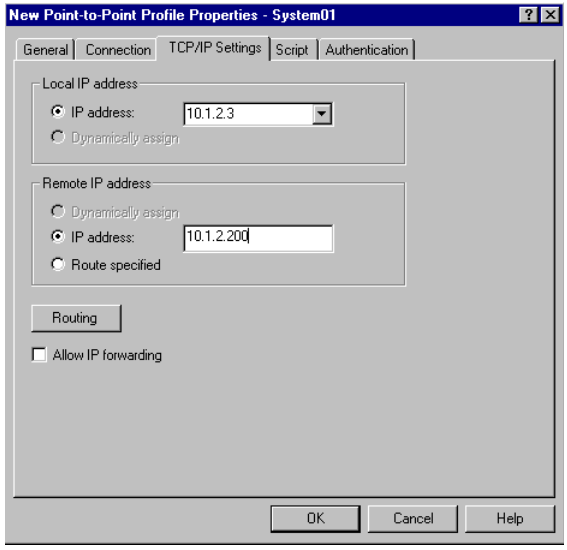

Figure 155. Point-to-Point Profile Screen: TCP/IP Settings Tab

Local IP address: Select *IP address* and specify the address of the Domino for AS/400 server to be contacted with this connection. In our example, the local LAN address 10.1.2.3 is used.

Remote IP address: Select *IP address* and specify an address for the calling system or client. In our example, we specified `10.1.2.200` for the client.

Note The remote IP address specified in the *TCP/IP Settings Tab* of the *Point-to-Point Profile* (Figure 155) must match the address specified in the ***TCP/IP Properties*** dialog box (Figure 166 on page 305) when you configure the client Dial-Up Networking**.**

12. Click the **Authentication** tab.

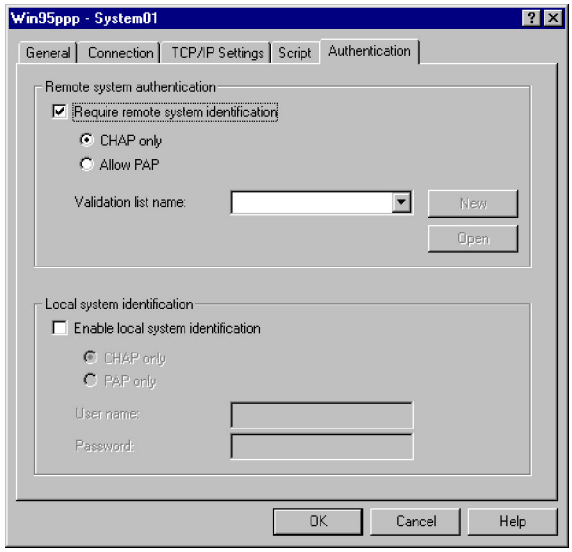

Figure 156. New Point-to-Point Profile Screen: Authentication Tab

Remote system authentication: If you would like to use remote system authentication, select the Require remote system identification box and select *CHAP only*.

Select a **Validation list name** from the list, or specify a new name. A validation list is a set of user names and passwords used for authentication when using a PPP profile.

13. Click **OK** to finish the PPP profile configuration.

Configuring the Remote PC Workstation for PPP Dial-in

Although the use of TCP/IP dial-up is not limited to the Windows 95 platform, this example is based on Windows 95. Setup of other 32-bit Windows environments such as Windows NT should be similar. With OS/2, the TCP/IP Network Dialer can be used.

To configure a remote Windows 95 workstation, you must use several functions of Windows 95 which may not yet be set up on your workstation. To activate these functions you must:

- Add Windows 95 Dial-Up Networking (see page 299),
- Add support for a Dial-Up Adapter (see page 301),
- Add TCP/IP protocol support for the Dial-Up Adapter (see page 303),
- and configure the connection to the AS/400 system (see page 306).

The necessary steps are described in detail in the following sections.

Add Dial-Up Networking to Windows 95

Dial-Up networking is an optional part of Windows 95 which enables you to connect to other computers by using a modem.

1. Double-click the icon **My Computer**.
2. Double click the icon **Control Panel.**
3. Double click the icon **Add/Remove Programs.**
4. Click on the tab labeled **Windows Setup**, and highlight **Communications.**

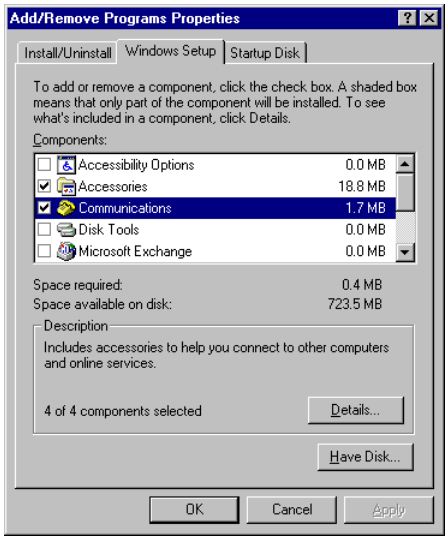
Add/Remove Programs Properties
Install/Uninstall
Windows Setup
Startup Disk
To add or remove a component, click the check box. A shaded box means that only part of the component will be installed. To see what's included in a component, click Details.
Components:
Accessibility Options 0.0 MB
Accessories 18.8 MB
Communications 1.7 MB
Disk Tools 0.0 MB
Microsoft Exchange 0.0 MB
Space required: 0.4 MB
Space available on disk: 723.5 MB
Description
Includes accessories to help you connect to other computers and online services.
4 of 4 components selected
Details...
Have Disk...
OK
Cancel
Apply

Figure 157. Add/Remove Programs Properties: Windows Setup

5. Click on **Details,** and place a check mark next to **Dial-Up Networking.**

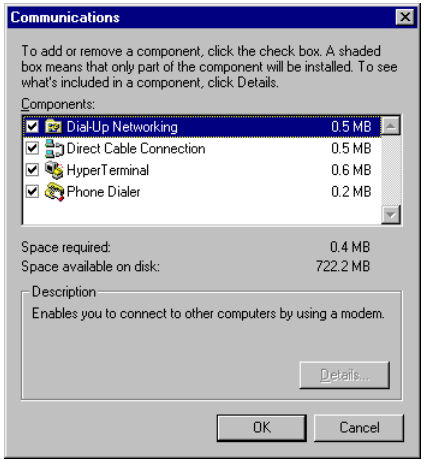
Communications
To add or remove a component, click the check box. A shaded box means that only part of the component will be installed. To see what's included in a component, click Details.
Components:
Dial-Up Networking 0.5 MB
Direct Cable Connection 0.5 MB
HyperTerminal 0.6 MB
Phone Dialer 0.2 MB
Space required: 0.4 MB
Space available on disk: 722.2 MB
Description
Enables you to connect to other computers by using a modem.
Details...
OK
Cancel

Figure 158. Communications Window

6. Click **OK** to close the *Communications* window.
7. Click **OK** to close the *Windows Setup* dialog box.
8. If prompted to reboot to activate, you need not do so until you get to the step described in “Reboot the Workstation” on page 306.

Add Dial-Up Adapter Support

After activating the support for Dial-Up networking, you now need to enable the software driver for a Dial-Up adapter. Follow the steps described below.

1. Double-click the icon **My Computer.**
2. Double-click the icon **Control Panel**.
3. Double-click the icon **Network.** You will see the *Network Configuration* dialog box as shown in Figure 159.
4. Look at the list box called “The following network components are installed:”. If you see a line called *Dial-Up Adapter*, you may continue with *“Add TCP/IP Protocol Support for the Dial-Up Adapter”* on page 303. You may see additional tabs, for example *Identification* or *Access Control*. Make sure the *Configuration* tab is selected.

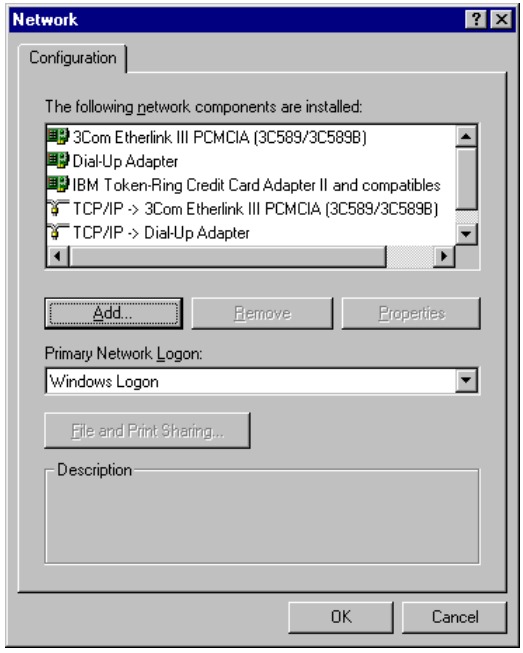

Figure 159. Network Configuration Dialog Box

5. If *Dial-Up Adapter* is not already listed in the Network Configuration window, click on **Add.** You will see the *"Select Network Component Type"* dialog box as shown in Figure 160.
6. In the *"Select Network Component Type"* dialog box highlight the line **Adapter** and click **the Add** button.

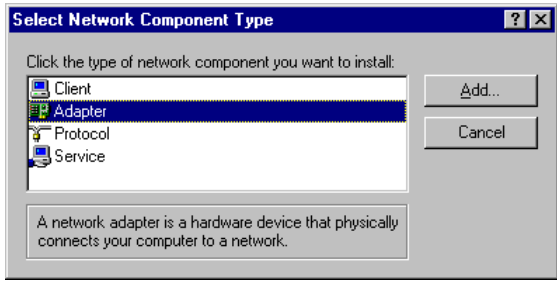

Figure 160. Network Component Type Selection Window

7. Highlight **Microsoft**, highlight **Dial-Up Adapter,** and click **OK**. You will see the *Select Network adapter* dialog box.

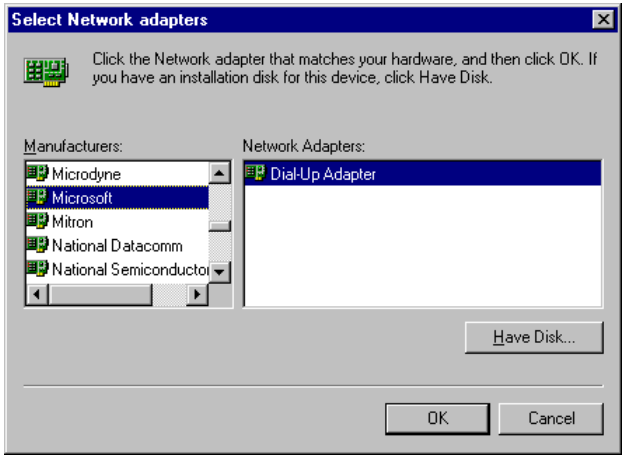

Figure 161. AS/400 Operations Navigator Window: Connection profiles

8. Click the **OK** button to return to the *"Select Network Component Type"* dialog box.
9. Click the **OK** button to return to the Network Configuration dialog box.

Add TCP/IP Protocol Support for the Dial-Up Adapter

If TCP/IP is not already listed in the *Network Configuration* Window, we need to add this too. The follow steps start again in the *Network Configuration* dialog box with the *configuration* tab selected.

1. Click on the **Add** button and the "*Select Network Component Type*" dialog box as shown in Figure 160 will be shown again.
2. Highlight the line with the title **Protocol** as shown in Figure 162.

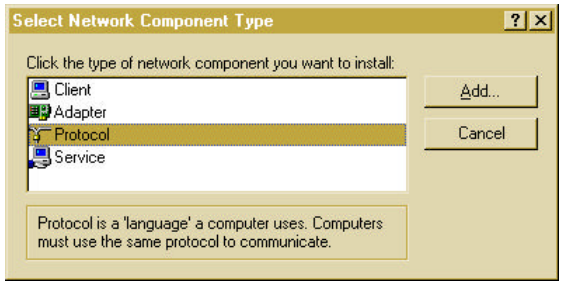

Figure 162. Select Network Component Type Protocol

3. Click on the **Add** button.
4. Highlight **Microsoft**,
5. highlight **TCP/IP**,
6. and click on the **OK** button.

7. From the Network Configuration Window, highlight **Dial-Up Adapter** and click on **Properties**.

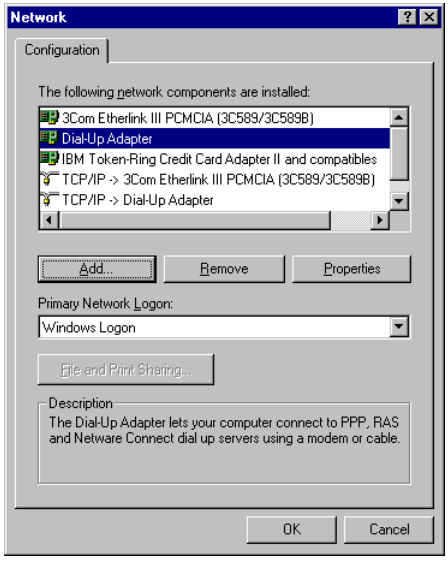

Figure 163. Network Configuration Window: Dial-Up Adapter Selected

8. Click on the **Bindings** tab. Make sure that **TCP/IP** is checked and click **OK**.

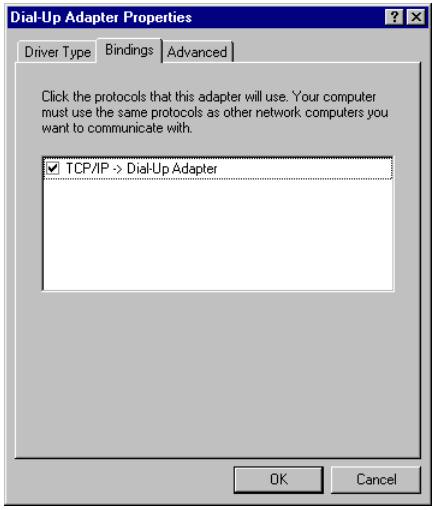
Dial-Up Adapter Properties
Driver Type
Bindings
Advanced
Click the protocols that this adapter will use. Your computer must use the same protocols as other network computers you want to communicate with.
TCP/IP -> Dial-Up Adapter
OK
Cancel

Figure 164. Dial-Up Adapter Properties: Bindings Tab

9. From the Network Configuration Window, highlight *TCP/IP->Dial-Up Adapter* and click on Properties.

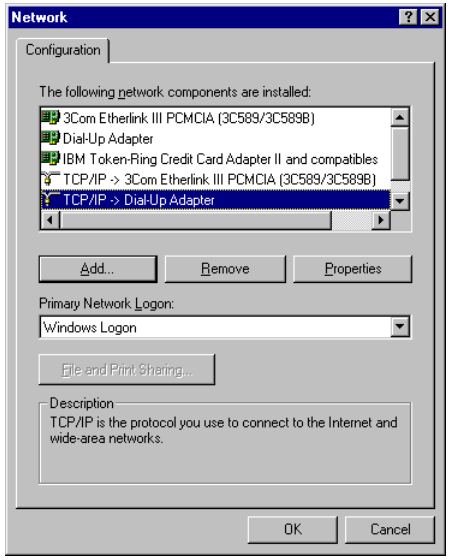

Figure 165. Network Configuration Window: TCP/IP-> Dial-Up Adapter

10. Set the IP address that will be used for the dial connection from this particular *workstation.* In our example, we used 10.1.2.200.

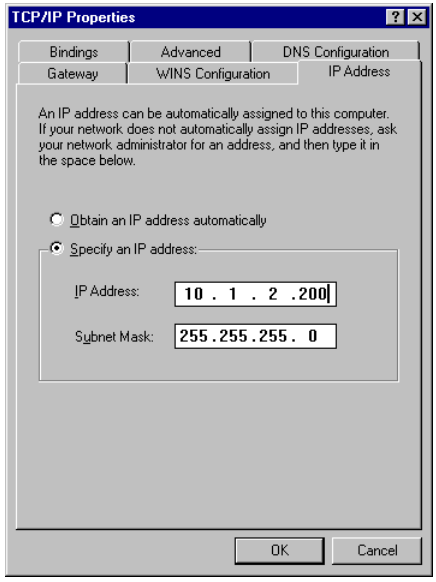
TCP/IP Properties
Bindings
Advanced
DNS Configuration
Gateway
WINS Configuration
IP Address
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.
Obtain an IP address automatically
Specify an IP address:
IP Address:
10 . 1 . 2 .200
Subnet Mask:
255.255.255. 0
OK
Cancel

Figure 166. TCP/IP Properties Window

The address specified in the *TCP/IP Properties* dialog box (Figure 166) must match the remote IP address specified in the *TCP/IP Settings Tab* of the *Point-to-Point Profile* (Figure 155 on page 297) when you configured the PPP connection profile on the AS/400 system.

Reboot the Workstation

To activate the changes in the previous steps you need to restart your workstation now.

Configure the Connection to the AS/400 System

Now, that you have set up a dial-up configuration , you need to define the connection to the specific system (or systems) to which you want to communicate.

1. Double-click the icon **My Computer** and you will see the *My Computer* folder**.**
2. Double-click the icon **Dial-Up Networking**.
3. Double-click **Make New Connection**
4. In the *Make New Connection* dialog (Figure 167), assign a name to the definition you are creating here. In our example, we use `PPP Connection to AS400`. The name you assign may not contain any special characters.

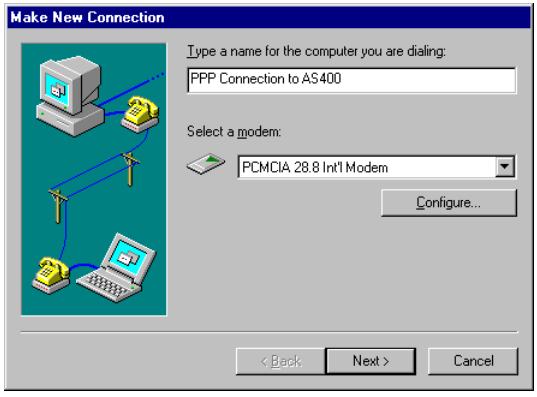

Figure 167. New Connection Window

5. Click on **Next** and type the phone number of the modem attached to the AS/400 system.
6. Click on **Next**.
7. Click on **Finish**.
8. A new icon is available in the window with the connection name you specified. Right click on the icon and select **Properties** from the context menu.

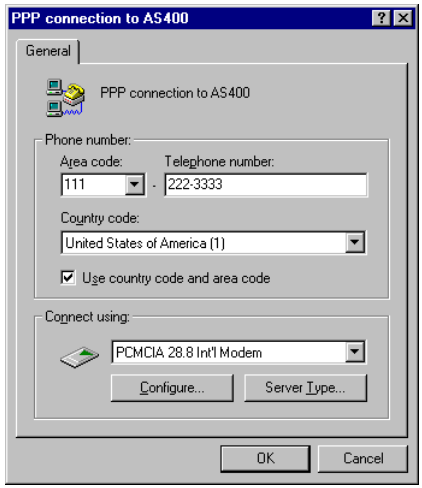

Figure 168. PPP Connection Properties Window

9. Click on **Configure** to open the **Modem Properties**. On the **General** tab, set the maximum speed appropriate for your modem. Click **OK**.
10. From the PPP Connection Properties window, Click on **Server Type**.

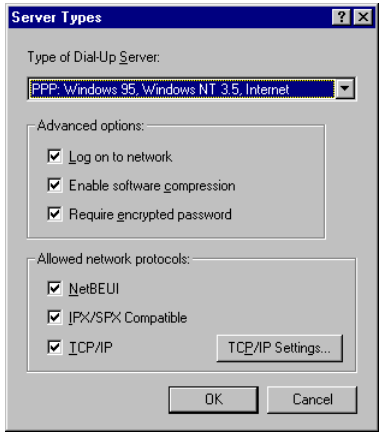

Figure 169. Server Types Window

11. Select "*PPP: Windows 95, Windows NT 3.5, Internet***"** from the pull-down box.
12. Click on ***Require encrypted password*** to put a check mark next to it.
13. Click on the **TCP/IP Settings** button and specify the IP address to use for the dial connection from this PC, or specify *server assigned IP address* to allow management of IP addresses from the AS/400 system.
14. Click **OK** to close the *TCP/IP Settings* dialog box.

15. Click **OK** to close the *Server* Types dialog box.
16. Click **OK** to close the *PPP Connection Properties* window.

Testing the PPP Connection

To use the newly configured AS/400 PPP connection, you must have a modem connected to the hardware adapter that the PPP line description is using. To test this connection prior to investing in modem hardware (or possibly making a dial concentrator decision), it is also possible to use a modem provided with the AS/400 system.

New AS/400 systems usually come with a modem for use with the Electronic Customer Support (ECS). This is typically an IBM 7852, 7855, or 7857 modem. It uses the synchronous mode to connect to ECS for service benefits such as download of PTFs and sending information for problem analysis. However, many AS/400 ECS modems can also operate in the asynchronous mode.

Set the Modem to Asynchronous Mode

AS/400 PPP can be set up to use the ECS modem in either the synchronous or asynchronous mode. Modems that operate only in the asynchronous mode are more common on PC workstations. Since both mode and speed of the modem must match on the dialing and answering systems, we discuss how to change an AS/400 ECS modem to operate in the asynchronous mode.

The IBM 7852-400 modem, which comes with the newer technology of many AS/400 systems[4], has physical dip switches. To enable the asynchronous mode, set all switches, except number 12, to the factory defaults. **Switch #12** controls whether the synchronous or the asynchronous mode should be used. This switch should be **DOWN** for asynchronous mode.

Special considerations with the 7857-017 modem

The IBM 7857-017 modem can be switched to the asynchronous mode using the following steps to enable one of the selectable factory configurations:

1. On the front panel, press the **down arrow** button until the *Configuration Options D12* display appears.
2. Press the **right arrow** button until *Select Factory* appears. Then press the **Enter** button.
3. Press the **up arrow** button until *option 4* appears. Then press the **Enter** button.

This sets the modem to factory option 4, which is the asynchronous configuration for this particular model. To reset the IBM 7857-017 to the synchronous mode of operation after testing is completed, follow the previous steps again, but this time, select factory option 3.

---

[4] Depending on the country where you ordered your AS/400 system, you may get different modems. Refer to the user's manual for the modem on how to switch to asynchronous mode for your modem.

If you use the 7857-017 modem, the AS/400 default modem information may need to be modified depending upon the country setting. The range of valid carrier time-out settings in register S7 varies by country. For example, the valid range for the US is 41 to 50.

The default modem answer setting for the 7857-017 in some versions of OS/400 incorrectly attempts to change register S7 to 30. Thus, if your country setting is US or any other country in which 30 is not a valid selection for that parameter, you may need to change the settings as described below.

Use Operations Navigator to Create Customized Modem Information
If you are using Operations Navigator Version 3 Release 2, you can create the required customized modem entry using a graphical interface. Otherwise, you will need to follow the steps under "Use a 5250 Display to Create Customized Modem Information" on page 310.

Note Operations Navigator Version 3 Release 2 can be used with either OS/400 Version 4 Release 2 or Version 4 Release 3.

To create the customized modem information using Operations Navigator Version 3 Release 2, perform the following steps:

1. From the Windows 95 or Windows NT desktop, start Operations Navigator.
2. Click on the plus sign (+) next to the icon showing the name of your AS/400 system to expand the tree.
3. Click on the plus sign (+) next to **Network**.
4. Click on the plus sign (+) next to **Point-to-Point**.
5. Click on the icon named **Modems**. A list of modems appears in the right pane of the navigator as in Figure 170.

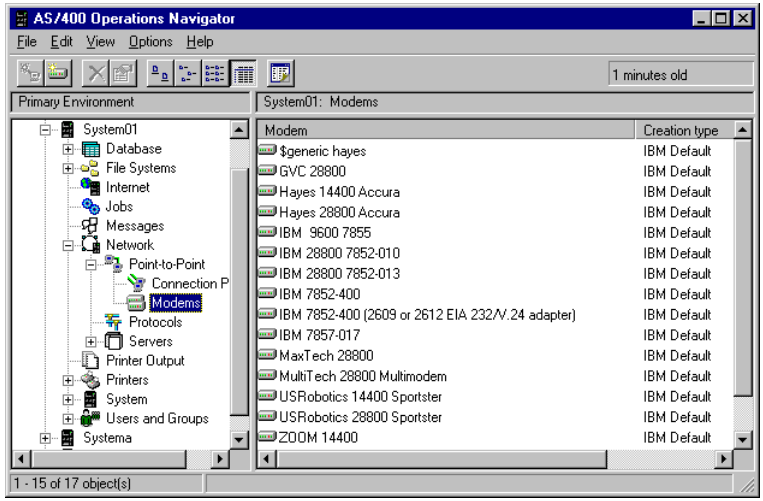

Figure 170 . AS/400 Operations Navigator -- Modems

6. From the list of modems, right click on the **IBM 7857-017** modem. A dialog box appears.
7. Select the item *New Modem Based On* from the context menu. This will open a new window with the title *New Modem Based on IBM 7857-017*.
8. In this new modem window, specify a unique new value for the Modem information name field, for example, *User-Defined 7857-017*.
9. Change the value of the *Modem answer command* field from `ATS0=2S7=30` to `ATS0=2`. That is, remove S7=30.
10. Click **OK** to create this new modem information entry.
11. Skip to "Change the PPP Connection Profile to Use the New Modem Entry" on page 313.

Use a 5250 Display to Create Customized Modem Information

If you have Operations Navigator Version 3 Release 1 Modification Level 3, the function to create a new modem entry based on an existing one is not available. To create the customized modem information using a 5250 interface, perform the following steps:

1. Start the *Work with Point-to-Point TCP/IP* (WRKTCPTP) command by entering the following in any AS/400 command line:

   `WRKTCPPTP`

2. Press **F8** (Work with modems).
3. Use option **3** to copy the modem information entry called *IBM 7857-017* to a new entry.

```
                Work with Point-to-Point TCP/IP Modem Information

Type option, press Enter.
  1=Add   2=Change   3=Copy   4=Remove   5=Display   6=Print

Opt  Name                                                          Source
 _   ____________________________________________________________
 _   $generic hayes                                               DEFAULTS
 _   GVC 28800                                                    DEFAULTS
 _   Hayes 14400 Accura                                           DEFAULTS
 _   Hayes 28800 Accura                                           DEFAULTS
 _   IBM  9600 7855                                               DEFAULTS
 _   IBM 28800 7852-010                                           DEFAULTS
 _   IBM 28800 7852-013                                           DEFAULTS
 _   IBM 7852-400                                                 DEFAULTS
 _   IBM 7852-400 (2609 or 2612 EIA 232/V.24 adapter)             DEFAULTS
 3   IBM 7857-017                                                 DEFAULTS
 _   MaxTech 28800                                                DEFAULTS
 _   MultiTech 28800 Multimodem                                   DEFAULTS
 _   USRobotics 14400 Sportster                                   DEFAULTS
 _   USRobotics 28800 Sportster                                   DEFAULTS
                                                                     More...
F3=Exit   F5=Refresh   F9=Command line   F12=Cancel   F17=Position to
```

Figure 171. Work with Point-to-Point TCP/IP Modem Information

4. Type a name for the new entry to be created, for example, *User-defined 7857-017*.

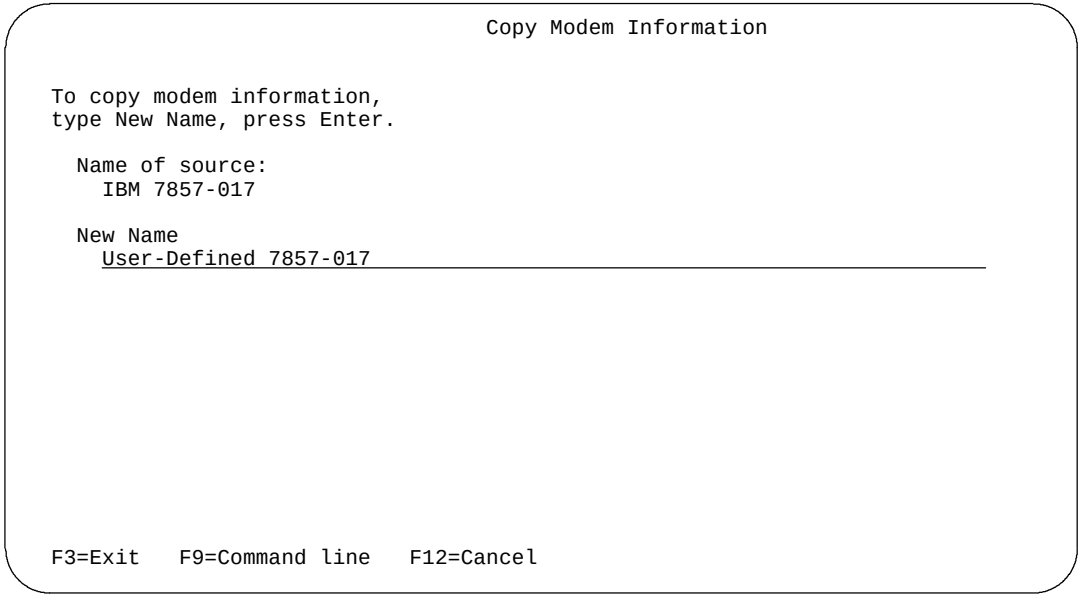

Figure 172. Copy Modem Information

5. Press **Enter** to continue. The resulting display contains a copy of the modem string settings from the *IBM 7857-017* entry.

```
                Copy TCP/IP Point-to-Point Modem Information

Modem information name:
  User-Defined 7857-017


Type changes, press Enter.

  Modem initialization string
    AT&M0&A0&D2&C1V1Q0&K2&E1&U4&S1

  Modem reset string
    AT&F

  Modem dial command
    ATDT

  Modem answer command
    ATS0=2S7=30



F3=Exit   F9=Command line   F12=Cancel
```

Figure 173. Copy TCP/IP Point-to-Point Modem Information

6. Change the value of the *Modem answer command* field from ATS0=2S7=30 to ATS0=2. That is, remove S7=30. The display should look like Figure 174.

```
                Copy TCP/IP Point-to-Point Modem Information

Modem information name:
  User-defined 7857-017


Type changes, press Enter.

  Modem initialization string
    AT&M0&A0&D2&C1V1Q0&K2&E1&U4&S1

  Modem reset string
    AT&F

  Modem dial command
    ATDT

  Modem answer command
    ATS0=2



F3=Exit   F9=Command line   F12=Cancel
```

Figure 174. Copy TCP/IP Point-to-Point Modem Information: after change

7. Press **Enter** to save your new modem setting entry.

Change the PPP Connection Profile to Use the New Modem Entry

Now, you must use Operations Navigator, to change your PPP connection profile to refer to the new modem entry created in the previous section. The following steps describe how to do this.

1. From the Windows 95 or Windows NT desktop, start Operations Navigator.
2. Click on the plus sign next to the icon showing the name of your AS/400 system.
3. Click on the plus (+) sign next to **Network**.
4. Click on the plus (+) sign next to **Point-to-Point**.
5. Open the list of connection profiles by clicking the icon named **Connection Profiles**.
6. Select and right click your PPP connection profile to open its ***Properties*** window.
7. Click on the **Connection** tab.
8. Click the **Open** button to edit the specified line description.
9. Click the **Modem** tab in the line description's properties. Open the pull-down list of modem information entries and select the name of the new entry you created in step earlier.
10. Click **OK** to save this change to the line description.
11. Click **OK** again to save and close the PPP connection profile.

Starting the PPP Connection

To start the newly created PPP connection profile with Operations Navigator, perform the following steps:

1. expand the tree under your AS/400 system,
2. then the one next to **Network,**
3. then **Point-to-Point** and then **Connection Profiles**.
4. Find your profile name in the list, right click on it, and click **Start**.

To connect to the AS/400 system from a remote Windows 95 workstation, double-click the Dial-Up Networking connection icon you created. This code may prompt you for a user ID and password if you have not already logged on to the workstation.

SLIP Dial-In Example

This section guides you through the configuration needed to have a remote SLIP client connect to your AS/400 system.

Configuring the SLIP Connection Profile on the AS/400 System

The configuration of a SLIP connection profile differs depending on whether you use an asynchronous line description or a PPP line description. PPP line descriptions can only be used for certain communication adapter types as described in "Prerequisites for Using PPP on an AS/400 System " on page 288. The following sections describe the configuration for each line type.

SLIP with an Asynchronous Line Description

These are the parameters that should be used for an asynchronous line that is attached to a modem:

```
CRTLINASC  LIND(ASCDOM) RSRCNAME(CMN01) CNN(*SWTPP)
   LINESPEED(19200) SWTCNN(*DIAL) AUTOANS(*NO) AUTODIAL(*YES)
   DIALCMD(*OTHER) INACTTMR(*NOMAX) MAXBUFFER(1500)
```

Tip As an alternative to typing the entire command syntax, you may type `CRTLINASC` on an AS/400 command line and press **F4** to request parameter prompting. Then you may request help information by positioning the cursor on any parameter and pressing the **F1** key.

In our example `ASCDOM` is the name of the line description to be created and `CMN01` is the resource name referring to a hardware resource on your AS/400 system. The resource name can be identified by using the *Work with Hardware Resources* (WRKHDWRSC) command.

To set up the AS/400 SLIP configuration, use the *Work with Point-to-Point TCP/IP* (WRKTCPPTP) command to define a point-to-point connection profile of type *answer*. Type the following command on any AS/400 command line:

```
WRKTCPPTP
```

Press **Enter** and the display shown in Figure 175 appears.

```
                        Work with Point-to-Point TCP/IP

Type option, press Enter.
  1=Add     2=Change   3=Copy   4=Remove          5=Display details   6=Print
  9=Start   10=End     12=Work with line status   14=Work with job

                                                    Line      Line    Job
Opt  Name        Mode   Type   Status          Description  Type    Name
1    WIN95DOM    *ANS

  (No configuration profiles)

                                                                      Bottom
F8=Work with modems   F9=Command line   F10=Local interface status
F11=Display text      F12=Cancel   F14=Work with active jobs   F24=More keys
```

Figure 176. Work with Point-to-Point TCP/IP (WRKTCPPTP)

Select option **1** (Add), enter a name for the new configuration profile (in our example, it is WIN95DOM), and then type ***ANS** as mode. Press **Enter** and you will see the prompt shown in Figure 176.

```
                    Add TCP/IP Point-to-Point *ANS Profile
                                                          System:   RCHASM01
Name:   WIN95DOM
Text    ____________________________________________

Type choices, press Enter.

TCP/IP information:
  Protocol type . . . . . :   *SLIP
  Local interface address . . . . . .   10.1.2.5          Address, F4 for list
  Remote IP address . . . . . .   10.1.2.200       Address
  Maximum transmission unit . . . . .   1006        576-1006
  Allow proxy ARP . . . . . .   N                   Y=Yes, N=No
  Add default route . . . . . .   N                 Y=Yes, N=No

Physical line information:
  Line description  . . . . . .   ASCDOM____        Name
  Line type . . . . . :   *ASYNC
  Autocreate controller and device      Y           Y=Yes, N=No
    Remote location name  . . . . .     ________    Name
                                                                    More...
F2=Change modem information   F3=Exit   F4=List   F9=Command line
F12=Cancel
```

Figure 177. Add a TCP/IP Point-to-Point *ANS Profile

Enter the parameters according to the following descriptions.

TCP/IP Information:

- **Local interface address** is the IP address of the Domino for AS/400 server you will contact with this SLIP connection.

  This value is the local IP address to use as the gateway address for the remote clients. It is used as a next hop value for a route or default route to the AS/400 system. Use **F4** to get a list of already-defined local addresses to use, or enter a new address. If an already-defined local address is chosen, then it can be used for Proxy ARP[5] on behalf of the remote system dialing in. The Proxy ARP flag has to be set to "Y" for this to occur.

- **Remote IP address** is the address the remote client will use for this SLIP connection.

  This is the address that the remote client should use as its local interface address. It is the IP address used to allow the remote system and the local AS/400 system to communicate. If the local IP address chosen already exists and is being used for Proxy ARP, then the remote IP address that you choose must be defined on the same subnet as the local IP address defined by its subnet mask.

- **Maximum transmission unit** should be set to 1006.

  The MAXBUFFER parameter of the *Create Asynchronous Line Description* (CRTLINASC) command can be used to specify the maximum size of the line's inbound and outbound data buffers. The default for the MAXBUFFER parameter is 896 bytes. The value specified for the SLIP Maximum Transmission Unit (MTU) must be less than or equal to the value of MAXBUFFER. In this example, we use 1500 bytes for MAXBUFFER.

- **Allow proxy ARP:** The default is "N". Set to "Y" if proxy ARP is to be used. This field can only be set to "Y" if the Local interface address defined is a true local interface that is already defined and the Remote IP address is defined to be on the same subnet as the local address.

Physical line information:

- **Line description:** The name of the asynchronous line description created earlier. A valid line description needs to be entered here. Only lines of type *ASYNC are supported.

- **Autocreate controller and device:** Y is usually a desirable option. Then TCP/IP creates the appropriate controller and device for the session. When the session is completed, the automatically created controller and device are deleted.

Press page down (**PgDn**) to see the second panel of the *ANS profile configuration. FigureFigure 177 shows the display after we filled in the specific parameters for our environment.

---

[5] Proxy ARP is a technique that allows one machine, the proxy agent, to answer ARP requests that are actually destined for a different machine. Proxy ARP is useful with SLIP because it allows a remote SLIP client to logically appear to be part of a local network (or on the same subnet).

```
                    Add TCP/IP Point-to-Point *ANS Profile
                                                          System:   RCHASM01
Name:   WIN95DOM
Text    ____________________________________________

Type choices, press Enter.

Modem information:
  Use a modem . . . . . .   Y                 Y=Yes, N=No
    Modem information name                    F4 for list
      ____________________________________________________________

Script source information:
  Use connection dialog script  . . .   Y     Y=Yes, N=No
    Member  . . . . . .   ANS400      Name
    File  . . . . . .   QATOCPPSCR    Name
      Library . . . . . .   QUSRSYS   Name
    ASCII character set identifier      00819     1-65533, *DFT


                                                                  More...
F2=Change modem information   F3=Exit   F4=List   F9=Command line
F12=Cancel
```

Figure 178. Add TCP/IP Point-to-Point *ANS Profile - Panel 2

Modem information:
Use a modem: We selected "Y" (Yes).

Modem information name: When you add a new profile, the field *Modem information name* is initially blank. If you specify a "Y" in the field *Use a modem*, you must enter a valid value for *Modem information name*. Press **F4** to display a Pop-up selection list of predefined modem strings.

Note If you are using an IBM 7857-017 modem, the default modem information may need to be modified depending upon the country setting. See Special considerations with the 7857-017 modem" on page 308 for details.

Script Source Information:
For this example, we used a script since we wanted an exchange of user ID, password, and IP addresses.

Use connection dialog script: We specified "Y" (Yes).

Member/file/library: This is the location of the connection script to use to allow remote systems to dial into the AS/400 system. This script will be used by the server. The remote system that dials in must have a compatible script. See "Creating and Changing Connection Scripts" on page 319 for information on how to use customized scripts.

ASCII character set identifier: The ASCII CCSID is used to translate ASCII to EBCDIC and EBCDIC to ASCII connection script data.

Press page down (**PgDn**) again to see the third configuration display. The Figure 178 shows the parameters changed to our specific environment.

```
                    Add TCP/IP Point-to-Point *ANS Profile
                                                          System:   RCHASM01
Name:   WIN95DOM
Text    ____________________________________________________

Type choices, press Enter.

Local system security:
  Allow IP datagram forwarding  . . .   N                 Y=Yes, N=No
  System access authorization list      DOMSLIP___        *NONE, Name




                                                                      Bottom
F2=Change modem information   F3=Exit   F4=List   F9=Command line
F12=Cancel
```

Figure 179. Add TCP/IP Point-to-Point *ANS Profile - Panel 3

Local system security section

Allow IP datagram forwarding: When a remote client connects to the AS/400 system, this value determines whether the TCP/IP stack allows IP datagrams originating from the remote host to be forwarded on to IP addresses other than the local IP address defined for the AS/400 system for this connection.

Note If IP datagram Forwarding is set OFF at the system level through the IPDTGFWD parameter on the CHGTCPA command, then the value for IP datagram forwarding on any of the SLIP profiles has no effect since IP datagram forwarding is not allowed for any TCP/IP interface.

System Access Authorization List

If an authorization list is specified, only the user profiles specified in the authorization list will be allowed to connect to this AS/400 system from a remote system. The option *NONE means that when a client is trying to connect to the AS/400 system, no user ID or password needs to be specified.

If there is no authorization list (that is you specified *NONE), it only means that there is no connection security. If the client does pass a User ID and Password, these values are ignored and the connection is allowed. However, there is still application level security such as Telnet USERID and password or, as in our case, a Notes ID that is needed. If the user wants to validate that the remote client is allowed to connect, then a valid system authorization list name can be entered here.

The authorization list is created by using option 1 of the *Work with Authorization List*s (WRKAUTL)[6] command. Then you add one or more AS/400 user profile names that should be authorized to connect to the list using option 2 (Edit) and then **F6** (add new user).

[6] Alternatively, AS/400 authorization lists can be created using the *Create Authorization List* (CRTAUTL) command and user profile entries can be added to the authorization list using the *Add Authorization List Entry* (ADDAUTLE) command.

The AS/400 user profiles may already exist. If not, you can create them using the *Create User Profile* (CRTUSRPRF) command before you add their names to the authorization list. The password included with the connection dialog must match the password specified for the AS/400 user profile.

In our example, we created an authorization list with the name `DOMSLIP`, and added the user profile name `DOMUSER` to it. The authorization list must be created before referring to it here. Press **Enter** to submit the command.

Note You are allowed to set both "Use connection script" to "N" and "System access authorization list" to a value other than *NONE. Providing the name of an (existing) authorization list forces "Use connection script" to "Y." An informational message is issued to explain why this change was made.

Creating and Changing Connection Scripts

You cannot change the content of the default connection script file `QATOCPPSCR` in Library QUSRSYS. If you want to use a modified script, you must first create your own connection script file. Do this by copying the default file using the *Copy File* (CPYF) command as follows:

```
CPYF FROMFILE(QUSRSYS/QATOCPPSCR) TOFILE(lib/file)
     FROMMBR(*ALL) TOMBR(*FROMMBR) MBROPT(*ADD) CRTFILE(*YES)
```

In the example above, *lib/file* represents your own new file. Now you may modify the copy of the script file. FigureFigure 179 shows an example of a script file.

```
*************************************************************************
*SERVER CONNECTION SCRIPT EXAMPLE WITH LOGIN AND PASSWORD / WIN95
(PROMPT)
& Userid:
(USERID)
& Password?
(PASSWORD)
& InternetLR/E>
(PROMPT)
& (IPGATE) IS AS/400 IP ADDRESS.
& (IPADDR) IS IP ADDRESS OF SYSTEM CALLING AS/400.
* END OF SERVER CONNECTION SCRIPT EXAMPLE
*************************************************************************
```

Figure 180. Example AS/400 Server Script for a Windows 95 Connection

Please refer to the latest version of *TCP/IP Configuration and Reference*, SC41-3420 for detailed script information.

SLIP with a PPP Line Description

To use a PPP line description, your AS/400 system must have one of the I/O adapters described in "Prerequisites for Using PPP on an AS/400 System" on page 288.

In order to establish a SLIP connection over a PPP line type with another system, you need to provide your AS/400 system with the information that allows it to do this. This information is stored in a *connection profile*. You need to use Operations Navigator to create a connection profile.

Note If your AS/400 system supports PPP line descriptions, the use of the PPP protocol is highly recommended over SLIP. The only environment in which SLIP would be used over a PPP line description is the case where the client machine accesses multiple systems, some of which support only SLIP. If you do have such an environment, follow the outline below to set up SLIP using a PPP line description.

Configuring the SLIP Connection Profile on the AS/400
To open a connection to the AS/400 system using Operations Navigator, perform the following steps:

1. From the Windows 95 or Windows NT desktop, start Operations Navigator.
2. Click on the plus sign next to the icon showing the name of your AS/400 system.
3. Click on the plus sign next to the icon named **Network**.
4. Click on the plus sign next to the icon named **Point-to-Point**.
5. Open the list of connection profiles by clicking the icon named **Connection Profiles**.
6. To check for existing Point-to-Point profiles, look for icons with the Protocol type SLIP and a connection type of switched line-answer. If PPP line profiles exist, you can view them by right-clicking the individual names and selecting **Properties** from the resulting context menu.

   Note If asynchronous line profiles exist, you can only start, stop, or delete these Point-to-Point profiles by right-clicking the individual names and selecting Start, Stop, or Delete from the resulting context menu.
7. To create a new SLIP connection profile, right-click **Connection Profiles** to open a context menu. Choose **New Profile** to access the General page of the New Point-to-Point Profile Properties dialog box.

Although there are some differences, outlined here, the procedure to follow is similar to Configuring the PPP Connection Profile on the AS/400 System, described in the section beginning on page 290.

8. Click on the plus sign (+) next to the icon showing the name of your AS/400 system in the main tree of Operations Navigator.
9. Click on the plus sign (+) next to the icon named **Network**.
10. Click on the plus sign (+) next to the icon named **Point-to-Point**.
11. Right-click **Connection Profiles** to open a context menu.

12. Choose **New Profile** to access the **General Page**. In our example we specify the following:

    Profile Name: WIN95SLIP

    Description: SLIP Connection for Domino clients

    Type: SLIP

    Mode: Switched line-answer

13. Click the **Connection** tab.

    Line Name: Select an existing PPP line description from the pull-down list or specify a name for a new line description.

    Maximum transmission units: 1006 bytes.

    If you specified a line name to create a new line description, Click on the **New** button and continue with step 14. If you selected an existing PPP line description and clicked on the **Open** button, skip to step 15..

14. Follow this step only if you clicked on the **New** button to create a new line description. From the **New Line Properties General** tab, select one of the listed Hardware resources.

    The Interface type must be: **RS232/V.24**, and the framing must be **Asynchronous**.

15. Click the **Link** tab and specify the appropriate line speed.

    Click the **Modem** tab and select the appropriate modem type from the pull-down box. If you are using an IBM 7857-017 modem, a customized modem information entry may need to be created first, using a 5250 interface. Refer to “Use a 5250 Display to Create Customized Modem Information” on page 310 for details.

16. Click **OK** to save the line description and return to the connection profile properties.

17. Click the **TCP/IP Settings** tab.

    Local IP address: Select IP address `10.1.2.3` in our example.

    Remote IP address: Select IP address `10.1.2.200` in our example.

18. Click the **Script** tab. Specify script information if desired. For more details about scripts on the AS/400 system, please refer to Creating and Changing Connection Scripts on page 319.

19. Click the **Authentication** tab.

    Remote system authentication: If desired, select the Require remote system identification box.

    Validation list name: Specify a new one, or select one from the pull-down list.

20. Click **OK** to finish the SLIP Profile configuration.

Configuring the Remote PC Workstation for SLIP Dial-in

Although the use of TCP/IP dial-up is not limited to the Windows 95 platform, this example is based on Windows 95. Setup of other 32-bit Windows environments such as Windows NT should be similar. With OS/2, the TCP/IP Network Dialer can be used.

Setup of the remote workstation involves the same steps as outlined in ”Configuring the Remote PC Workstation for PPP Dial-in” on page 298 for dial-up using PPP, with these exceptions:

- One difference is that the *Server Type* in the Dial-Up Networking connection should be set to **SLIP: UNIX Connection**.
- The other difference is that there is an additional step between "Add Windows 95 Dial-Up Networking" (page 299) and "Add Dial-Up Adapter Support" (page 301) to install SLIP and Scripting for Dial-Up Networking.
- Additional software may need to be downloaded form the Microsoft home page and installation your workstation.

The following procedure details this installation process:

1. Create a folder called `SLIP` on the disk of your PC.
2. Using a Web browser go to the following page:
   `http://www.microsoft.com/windows/download/dscrpt.exe`
3. Download the file **dscrpt.exe** to the `SLIP` folder.
4. Run **dscrpt.exe**, which is a self-extracting file.
5. Double-click the icon **My Computer.**
6. Double-click the icon **Control Panel.**
7. Double-click the icon **Add/Remove Programs.**
8. Click on the tab labeled **Windows Setup**.
9. Click on the **Have Disk** button.
10. Click on the **Browse** button.
11. Select the SLIP folder from the directory tree. RNAPLUS.INF should be highlighted in the left side of the Open box.
12. Click the **OK** button.
13. Click the **OK** button again.
14. Put a check mark in the box next to *SLIP and Scripting for Dial-Up Networking*.
15. Click **Install**, and click **OK**.

More details about this and optional connection scripts can be found in the manual *AS/400 Client Access for Windows 95/NT - Setup V4R2,* SC41-3512-04 in section 3.3.1 entitled "Setting up to Connect to AS/400" and on the Web on this page:

```
Http://www.microsoft.com/windows/downloads/contents/
                              admintools/w95scriptsup/default.asp
```

Testing the SLIP connection

SLIP uses a modem in the asynchronous mode. The modem information described in the section entitled “Testing the PPP Connection” on page 308 applies to SLIP as well as PPP.

SLIP and PPP connection profiles can be started and stopped using either an AS/400 CL command (from a 5250 display) or using Operations Navigator. You may be more comfortable using the interface that was used for configuration and setup (5250 when using an asynchronous line description or Operations Navigator when using a PPP line description).

Using an AS/400 CL Command to Start a SLIP Profile

If you are using a 5250 session, you need to issue the *Work with Point-to-Point TCP/IP Profiles* (WRKTCPPTP) command. Type the following command on any AS/400 command lime and press **Enter***:*

```
WRKTCPPTP
```

From the *Work with Point-to-Point TCP/IP* (WRKTCPPTP) panel, select Option **9** (Start) to start the profile. After the profile has successfully started, the status of the profile should be RINGW (ring waiting). It is necessary to press **F5** for Refresh to update the display. If the status stays in STRSSN, there may be a message in the QSYSOPR message queue.

Using Operations Navigator to Start a SLIP Profile

If you are using Operations Navigator, expand the tree under your AS/400 system, then the one next to **Network,** then **Point-to-Point** and then click on **Connection Profiles**. Find your profile name in the list, right click on it, and click **Start**.

To connect to the AS/400 system from a remote Windows 95 workstation, double-click the Dial-Up Networking connection icon you created.

Server-to-Server Dial Connections with Remote LAN Service

Automatic server-to-server dialing for Domino servers is accomplished with a function known as *Remote LAN Service.* Domino for AS/400 supports the Remote LAN Service. This capability allows a Domino server to establish a connection with a remote Domino server through a telephone line by initiating the dialing process. Of course, both servers must be connected to the phone line by modems.

You can use the Remote LAN Service to perform tasks such as remote Domino server replication or mail routing between two Domino servers. The servers may both be AS/400 systems, or the answering system may be a Domino server running on another operating system platform.

Remote LAN Service supports replication of Domino databases and mail routing of Notes mail only. Currently, Domino for AS/400 does not directly support dial-up to an Internet Service Provider (ISP) to send and receive SMTP mail. Recent extensions to the SMTP Internet standard to support dial-up mail may very likely pave the way for Domino for AS/400 to support this capability in the future. In the meantime, the functionality can be addressed using customized services or companion products such as EverGreen/400 from Inventive Designers.

The protocol used for Remote LAN Service is PPP or SLIP, in much the same way as client dial-up connection to the server. However, client dial involves manual initiation of the connection at the Notes client. Remote LAN Service, on the other hand, is a function that allows the Domino server to start the dialing without AS/400 operator intervention.

Note Remote LAN Service is available for Domino for AS/400 running on OS/400 Version 4 Release 2 or higher. It does not require the Dial on Demand functionality that is available beginning with OS/400 Version 4 Release 3 to automatically establish the switched line connection.

For more details on setting up remote LAN service in general, see *Getting Started with the Domino Server* or the *Domino Administration Help* database (HELPADMN.NSF). The following information applies only to the AS/400 system.

AS/400 Requirements

To use the Remote LAN Service, your AS/400 system must have the following hardware:

- Modems
- Modem cables
- Depending on the model of your AS/400 system, one of the following I/O adapters:
  - 2699 Two Line WAN IOA
  - 2720 PCI WAN/Twinaxial IOA
  - 2721 PCI Two-line WAN IOA

You must also have the following software:

- OS/400 Version 4 Release 2 or higher with the latest cumulative PTF package applied. Specific required PTFs include SF46406 and SF48968.

- AS/400 Client Access for Windows 95/NT, Version 3 Release 1 Modification 3 or higher. Use the Operations Navigator component of Client Access to create the Point-to-Point Protocol (PPP) connection profiles.
- The latest version of Domino for AS/400 with the most recent quarterly maintenance update (QMU) is recommended. We tested with Domino for AS/400 4.6.2 and initially experienced some problems that have been resolved with QMU 4.6.2a.

Setting Up Remote LAN Service

Domino for AS/400 Remote LAN Service supports server-to-server dial-up communications using PPP connection profiles and associated PPP line descriptions. The answering system may be another Domino for AS/400 server, or may be a Domino server on another platform that supports dial-up using the PPP protocol.

Setting up Remote LAN Service for Lotus Domino for AS/400 is similar to setting up Remote LAN Service for Domino in a Windows 95 or Windows NT environment. You need to perform four tasks:

1. Create a PPP connection profile on the calling system.

   The calling Domino for AS/400 server requires a PPP connection profile of type *DIAL. Domino for AS/400 Remote LAN Service will start the *DIAL connection to initiate dialing.

2. Create a comparable communications configuration on the answering system.

   If the answering system is a Domino for AS/400 server, that system requires a PPP connection profile of type *ANS. Before a successful connection can be made, the *ANS profile must be already active and the modem waiting for incoming call.

   Domino for AS/400 does not automatically start the *ANS profile. You can do one of the following so that the profile becomes active:

   - Use Operations Navigator, right mouse click the connection profile and select **Start** in the pull down menu.
   - Use option **9** in the *Work with Point-to-Point TCP/IP* (WRKTCPPTP) display.
   - Use the *Start Point-to-Point TCP/IP* (STRTCPPTP) command from an AS/400 command line or a CL program. A CL program would be useful to start the connection profile automatically every time after an AS/400 IPL has been performed. In this case you would have to modify the program referred to in the QSTRUPPGM system value.

   Note If the same communications adapter on a single AS/400 system needs to serve as both a calling system and an answering system, you would create

two PPP profiles referring to the same line description -- one for *DIAL and one for *ANS.

3. Create a Connection document in the Domino Public Address Book of the calling server.

4. Configure the appropriate Domino port in the Server document for the answering server in the Public Address Book.

   Here we describe an example scenario with a Domino for AS/400 server called `AcmeA/Acme` running on an AS/400 system named `SYSTEM01`, and a Domino for AS/400 server called `AcmeB/Acme` running on an AS/400 system named `SYSTEM02`. In this example, both servers are in the same Domino domain called `Acme`, with an organization of the same name. SYSTEM01, the calling system, has IP address 10.1.2.3. `SYSTEM02`, the answering system, has IP address 10.1.2.4.

Creating a *DIAL PPP Profile on the Calling System

On a Windows 95 or NT workstation connected to the calling AS/400 system, perform the following steps using Operations Navigator:

1. In the Operations Navigator window, find the name of the AS/400 system for which you want to create the calling PPP profile. Click the plus **(+)** sign to expand the directory.

2. Click the plus (+) sign next to **Network**.

3. Click the plus (+) sign next to **Point-to-Point** and you will see the existing connection profiles (if any) in the right pane of the window as shown in Figure 180.

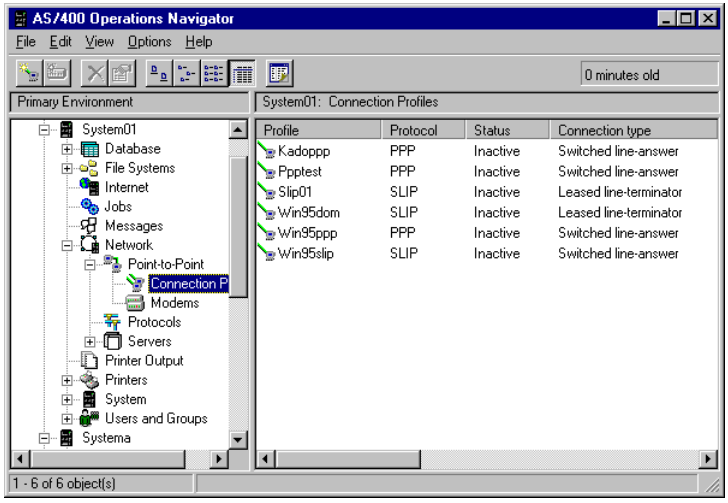

Figure 180. Connection Profiles in Operations Navigator Window

4. Right-click on *Connection Profiles* to open a context menu.

5. Choose **New Profile** from the context menu. You will see the *New Point-to-Point Profiles Properties* box with five tabs.

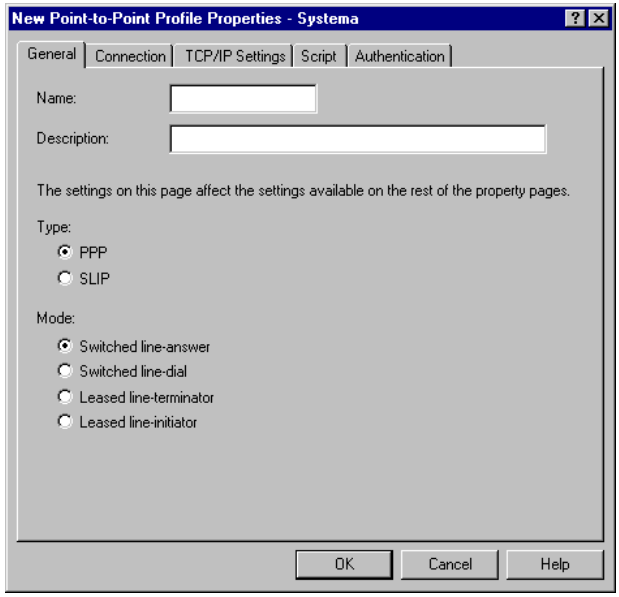

Figure 181. New Point-to-Point Profile Properties

6. On the **General** tab, specify a profile name of ten characters or less, and provide a meaningful description as shown in Figure 3.

7. Choose type *PPP* and mode *Switched line-dial* Figure 182**.**

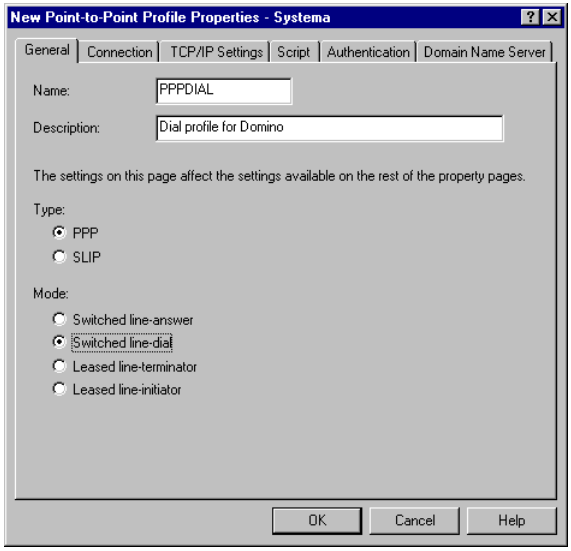

Figure 182. New Point-to-Point Profile Properties -- filled in

8. Click the **Connection** tab.

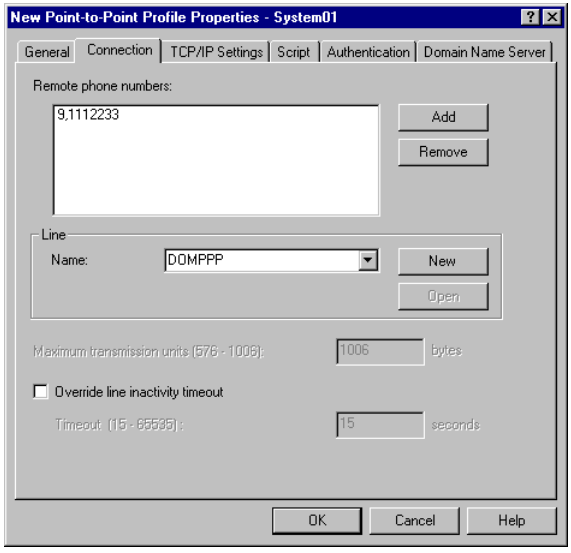

Figure 183. New Point-to-Point Profile Properties: Connection tab

9. Click **Add** and specify the phone number of the answering system.

Note Up to three phone numbers can be added in this fashion if the same PPP profile will be used to access multiple answering systems.

10. Type a Name for the Line description. In our example, we typed `DOMPPP`. Instead, if a PPP line description already exists, you may select it from the drop-down list.

11. If you typed a new name, Click the **New** button. A dialog box called *New Line Properties* will appear (Figure 184).

    Note If you selected an existing line description from the drop-down list, click the **Open** button instead of **New**. You will simply be referring to the next few steps to validate existing line properties instead of entering them for the first time. Any parameters may be modified except those on the **General** tab. If the **General** tab is not configured correctly, you must create a new line description.

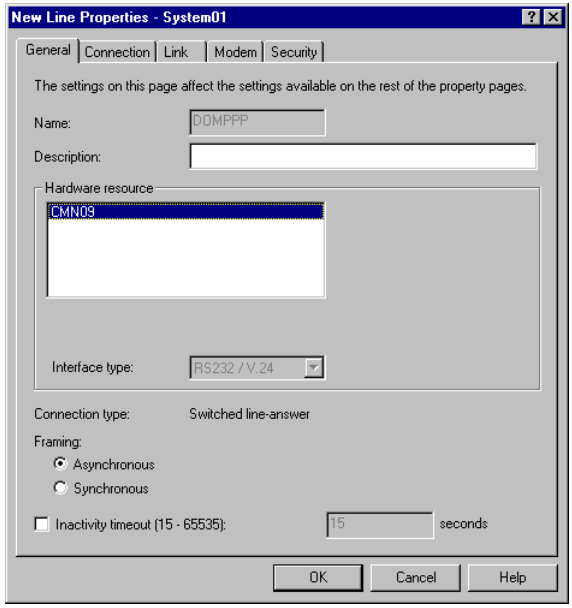

Figure 184. New Line Properties - General Tab

12. On the page with the General tab, select one of the listed Hardware resources. The Interface type must be **RS232/V.24**.

    The PPP protocol supports either synchronous or asynchronous framing, depending on your modem type and setup. Framing type must be the same for both calling and answering servers.

13. On the **Connection** tab, accept the default values as shown in Figure 152.

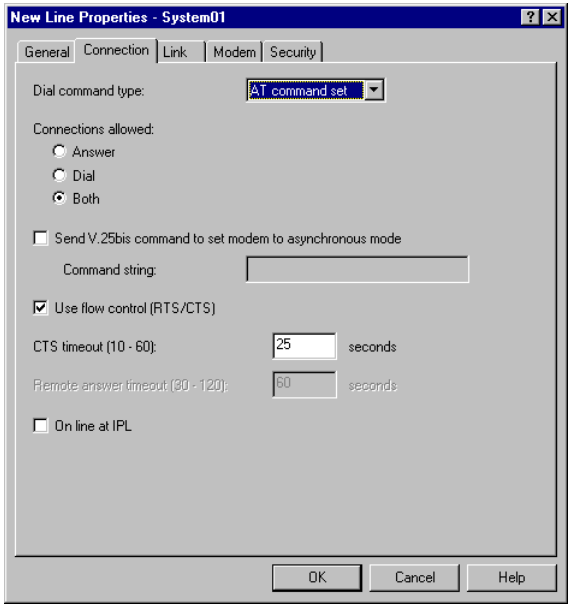

Figure 185. New Line Properties - Connection Tab

14. Click on the **Link** tab and specify the maximum line speed supported by your hardware as shown in Figure 186.

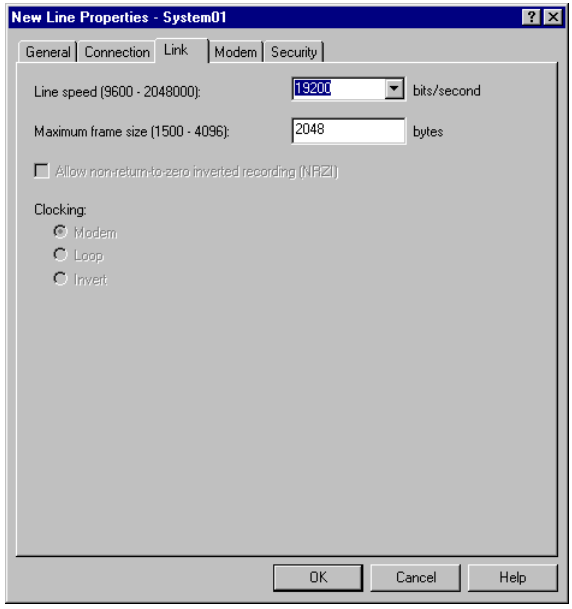

Figure 186. New Line Properties - Link Tab

15. Click the **Modem** tab and select the appropriate modem from the **Name** pull-down box. If you are using an IBM 7857-017 modem, a customized modem information entry may need to be created. Refer to “Special considerations with the 7857-017 modem“ on page 308 for details.

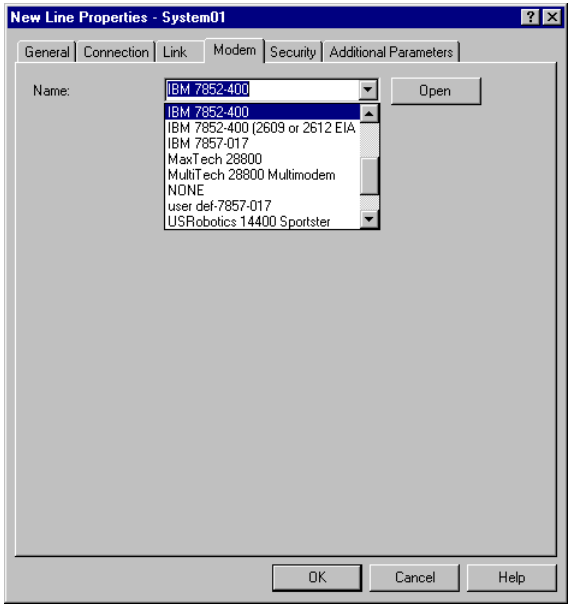

Figure 187. New Line Properties - Modem Tab

16. Click the **OK** button to close the *New Line Properties* box and return to the *Point-to-Point Profiles* Properties box.

17. Click the **TCP/IP Settings** tab. Typically, the answering system assigns an IP address to an incoming call. If this is the case, choose *Dynamically assign* for both the Local IP address and the Remote IP address.

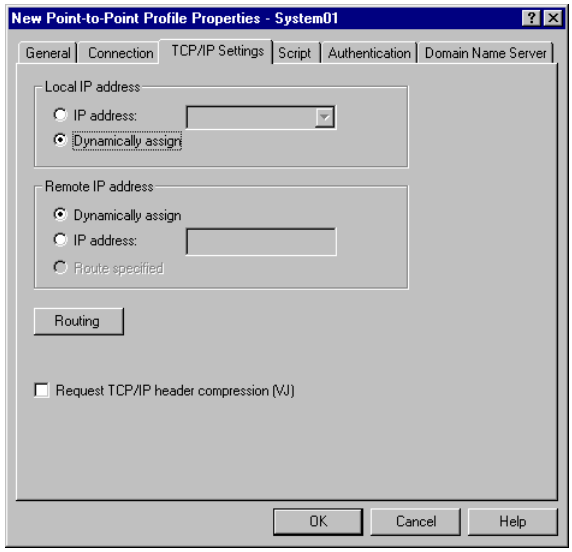

Figure 188. New Point-to-Point Profile Properties: TCP/IP Settings tab

18. Click the **Authentication** tab.

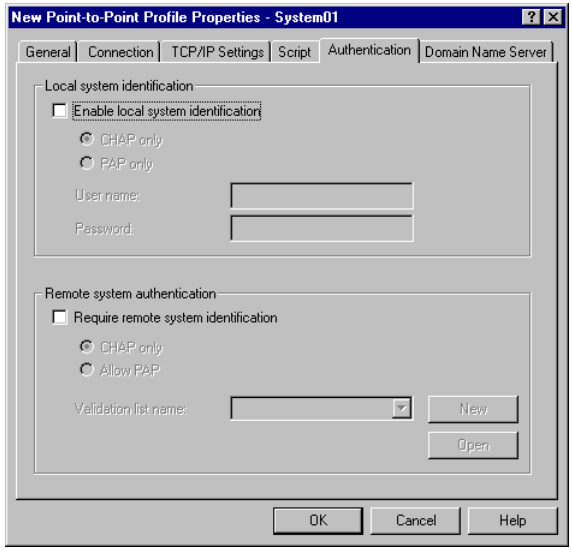

Figure 189. New Point-to-Point Profile Properties: Authentication tab

If the answering system is an AS/400 system, local system identification is optional. However, if the answering system is a Windows NT system running the RAS server component, you must enable local system identification. In addition, the option must be set to *PAP only*. You would then specify the User name and Password of a "RAS enabled" user on the Windows NT system, for example, the administrator.

19. Click **OK** to finish creation of the *DIAL PPP profile.

Creating a *ANS PPP Profile on the Answering System

Use the same procedure that you used to create the *DIAL profile, except:

- On the **General** tab, choose a mode of **Switched line-answer**.
- For the **TCP/IP Settings**, specify an IP address for both the *Local IP Address* and the *Remote IP address*. Local refers to the IP address of the Domino server to be contacted on the answering system. In our example, this is 10.1.2.4. Remote refers to the IP address of the Domino server on the calling system -- in our example, 10.1.2.3..

For step-by-step instructions for creating a switched-line answer profile, please see “Configuring the PPP Connection Profile on the AS/400 System” on page 290.

Creating the Connection Document

Using a Notes administrator workstation, set up a Connection document in the Public Address Book of the calling Domino server:

1. From the Notes workspace, choose **File - Tools - Server Administration.**
2. Click **Servers** and choose **Servers View.**
3. Choose **Create - Server - Connection** to set up a new connection document as shown in Figure 190**.**

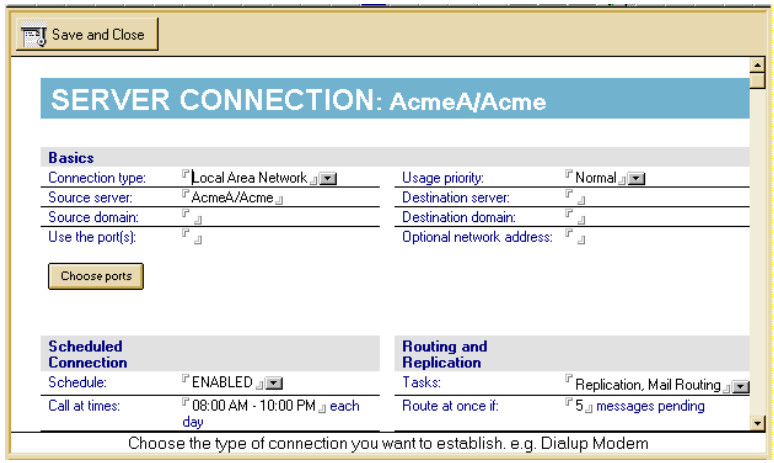

Figure 190. New Server Connection

4. In the *Connection Type* field, click on the down arrow (▼) and select *Remote LAN Service* from the drop-down list.

5. Click the **OK** button in the *Select keywords* dialog to enter your selection. The appearance of the *Server Connection* form will change as shown in Figure 191.

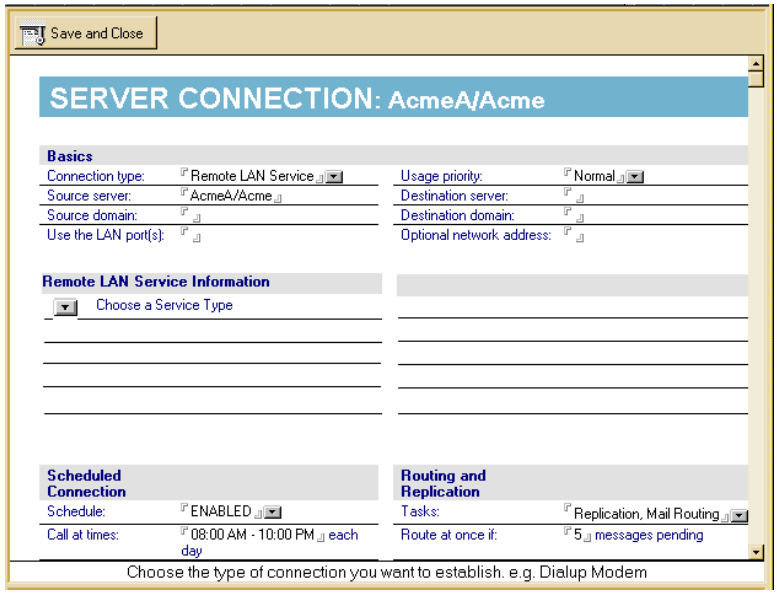
Save and Close
SERVER CONNECTION: AcmeA/Acme
Basics
Connection type: Remote LAN Service
Usage priority: Normal
Source server: AcmeA/Acme
Destination server:
Source domain:
Destination domain:
Use the LAN port(s):
Optional network address:
Remote LAN Service Information
Choose a Service Type
Scheduled Connection
Routing and Replication
Schedule: ENABLED
Tasks: Replication, Mail Routing
Call at times: 08:00 AM - 10:00 PM each day
Route at once if: 5 messages pending
Choose the type of connection you want to establish. e.g. Dialup Modem

Figure 191. New Server Connection after Remote LAN Service selected

6. Fill in the fields in the **Basics** section of the server connection document:

Source server: Type the fully qualified name of the calling Domino server. In our example, this is `AcmeA/Acme`. A fully qualified name is made up of at least a common name and the organization. In your environment, it may contain organizational units as well. You can verify the fully qualified name by looking at the *Servers View* under *Server* in the Public Address Book.

Source domain: Type the Domino domain name of the source server. Our Domino domain name happens to be the same name as the organization, `Acme`. This is the default case, but may not be true in every situation.

Destination server: Type the fully qualified name of the answering Domino server. In our example, this is `AcmeB/Acme`.

Destination domain: Type the Domino domain name of the destination server. In our example, the destination server is in the same Domino domain as the source, although that is not always the case.

Use the LAN port(s): Type the name of an existing Domino port that is used by the source server for TCP/IP LAN connectivity. If you have made no changes to Domino port configuration, the default is `TCPIP`. You can verify enabled port names by looking at the *Network Configuration* section of the server document for the source server in the Public Address Book.

7. In the *Remote LAN Service Information* section, click the **down arrow** next to *Choose a Service Type* and you will see the *Remote LAN Services* dialog box as shown in Figure 192.

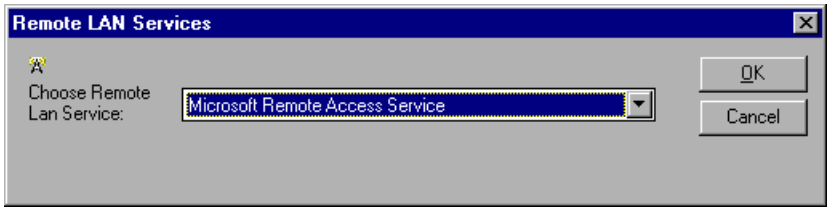

Figure 192. Remote LAN Services Dialog Box

8. Make sure that *Microsoft Remote Access Service* is selected, and click **OK**. The *Microsoft Remote Access Service* dialog box as shown in Figure 193 appears.

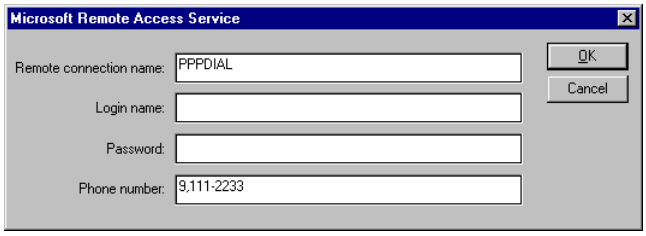

Figure 193. Microsoft Remote Access Service Window

9. Fill in the appropriate information into the *Microsoft Remote Access Service* dialog box as described below:

   Remote connection name: Type the name of the *DIAL PPP profile you created on the calling system. In our example, it is `PPPDIAL`.

   Login name and password: Leave these fields blank. These parameters are ignored by the Domino for AS/400 remote LAN service implementation. The PPP profile can optionally be configured with system authentication. Domino has built-in security that ensures users must have a proper ID to access the server.

   Phone number: Type the phone number of the modem attached to the answering system. If it does not, match the information in the PPP profile, the phone number specified on this window overrides what was originally in the profile.

10. Click the **OK** button to return to the *Connection* form.

11. If you want to set up a schedule for this connection, fill in the *Scheduled Connection* section and select *Enabled* in the *Schedule* field.

12. In the *Routing and Replication* section, choose *Replication, Mail Routing,* or both of these in the *Tasks* field. If necessary, fill in or modify any of the other parameters related to routing or replication behavior.

13. Click **Save and Close**.

Setting up the Server Document

In order for two Domino servers to communicate for purposes of mail routing or replication, the Public Address Book of the calling Domino server must contain a server document for the answering Domino server. Since Domino for AS/400 communicates using the TCP/IP protocol, that server document must have a Domino port enabled for TCP/IP communications.

If both servers are in the same domain, a server document for the answering Domino server will already exist in the Public Address Book. In this case, you simply need to verify that a Domino port has been enabled on that server to use the TCP/IP protocol with the correct IP address.

If the answering server is in a different domain, you need to create a server document for it in the calling server domain's Public Address Book. If the answering server is in a different organization, you will also need to cross-certify the server ids. For more information on replication refer to the chapter *Setting Up Replication* in the book *Getting Started* with the Domino Server. For more information on mail routing refer to the chapter *Setting Up* Mail in the book *Extending* the Domino System. The same information on both functions can also be found in the *Domino Administration Help* database (HELPADMN.NSF).

Use a Notes administrator workstation to set up a Server document for the answering server in the Public Address Book of the calling server:

1. From the Notes workspace, choose **File - Tools - Server Administration**.
2. Click **Servers** and choose **Servers View**.
3. If a server document for the answering server already exists, open it in edit mode and continue with step 4. Otherwise, choose **Create - Server - Server**.
4. Specify the server settings for the answering server. Make sure you provide information for the Network Configuration. For an example of the Network Configuration settings, see the table below.

Port	*Notes Network*	*Net Address*	*Enabled*
TCPIP	NETWORK1	10.1.2.4	ENABLED

   One named port must be enabled with the correct IP address (or host name known to a Domain Name Server) of the answering server. All four columns must be filled in. The name of the port is not required to be *TCPIP*, but *TCPIP* is a commonly used name that is the default for most Domino implementations. If a port is listed but is not enabled, click on **Enabled** in the rightmost column for that row.
5. Click the **Save and Close** button.

Validating the Connection

In order for a successful connection to be made using Remote LAN Service, the *ANS PPP profile must be active on the answering system, waiting for an incoming call.

To start the *ANS PPP profile using Operations Navigator on the answering system, click on **Network,** then **Point-to-Point** and then click on **Connection Profiles**. Find your profile name in the list, right click on it, and click **Start**. If you click **View,** then **Refresh** to refresh the screen, the status should change to *Session job starting*, and then *Waiting for incoming call.*

Tip You can also use the **F5** key to refresh the status shown on your display.

On the calling system, Domino for AS/400 should automatically start the *DIAL PPP profile when replication or mail routing is initiated. This happens either according to the schedule, if schedule is enabled in the connection document, or using Domino console commands.

In either case, if the connection document has type Remote LAN Service and replication or mail routing is specified as a task, Domino for AS/400 automatically invokes a , which automatically starts the *DIAL profile name specified in the Remote connection name field of the connection document. When the PPP session has been successfully activated, that session is used for the initiated mail routing or replication task. Once the exchange of information has completed, Domino should automatically end the *DIAL profile.

Tip You may either use the *replicate* (rep *servername*) Domino console command to start replication manually or use the *Show Schedule* (sh sch) command to find out at what time the next replication is planned.

At the time of the replication (or mail routing), you may use the *Work with Point-to-Point TCP/IP* (WRKTCPPTP) command from an AS/400 command line (not the Domino console), to watch the status of the *DIAL profile. Starting with the status `INACTIVE` or `OUTQ`, the status should change several times till it finally stays at `ACTIVE`.

At this point replication will occur (this can be seen at the Domino console or in the replication events view of the log.nsf database). After the replication has finished, the status of the connection profile should change again several times till it stays in either `OUTQ` or `INACTIVE`.

Troubleshooting

If Domino attempts to start the *DIAL PPP profile and is unsuccessful, you should see error messages on the Domino console beginning with the prefix `RAS400`. If no messages appear on the Domino console, it is possible that the program to start the session is not being invoked. Make sure that you are running the latest quarterly maintenance release (QMU) of Domino for AS/400 4.6.2 or later.

If you receive a Domino console message *Unable to Start Connection*, there are a few places to check for information about what is wrong. First, display the QSYSOPR message queue and look for any messages relating to the communications hardware interface. Next, look for job logs in the list of spooled output files logged for the user QNOTES. To do this, issue the following *Work with All Spooled Files* (WRKSPLF) command on any AS/400 command line:

```
WRKSPLF QNOTES
```

Display any job logs that are listed. If you see the message "Not authorized to command STRTCPPTP in library *LIBL", double check that you have PTF SF46406 installed and that you are running the latest quarterly maintenance release (QMU) of Domino for AS/400 4.6.2.

Problem determination specifically related to the PPP profile is available using the *Work with Point-to-Point TCP/IP* (`WRKTCPPTP`) command.

Type the following command on any AS/400 command line and press **Enter**:

```
WRKTCPPTP
```

You will see the *Work with Point-to-Point TCP/IP* list display as shown in Figure 194.

```
                        Work with Point-to-Point TCP/IP

Type option, press Enter.
  1=Add     2=Change   3=Copy   4=Remove          5=Display details   6=Print
  9=Start   10=End     12=Work with line status   14=Work with job

                                                    Line       Line     Job
Opt  Name         Mode   Type   Status           Description  Type     Name
__   __________   _____
__   IN           *ANS   *PPP   INACTIVE         IN           *PPP
__   PPPDOMANS    *ANS   *PPP   INACTIVE         PPPDOMASC    *PPP
__   SAKAIPPP     *ANS   *PPP   INACTIVE         SAKAIPPP     *PPP
__   OUT          *DIAL  *PPP   INACTIVE         OUT          *PPP
__   PPPDOMSVR    *DIAL  *PPP   OUTQ             PPPDOMASC    *PPP     QTPPDIAL09



                                                                      Bottom
F8=Work with modems   F9=Command line   F10=Local interface status
F11=Display text      F12=Cancel   F14=Work with active jobs   F24=More keys
```

Figure 194. Work with Point-to-Point TCP/IP list display

If the status is *OUTQ*, there are job logs or other print output in the output queue for the most recent job that started a Point-to-Point session . Unless the status of the profile is *INACTIVE*, you may type option **14** next to your *DIAL profile and press the **Enter** key to work with that job. The *Work with* Job display shown in Figure 195 appears.

```
                              Work with Job
                                                          System:   SYSTEM01
Job:   QTPPDIAL09     User:   QTCP          Number:   160833

Select one of the following:

     1. Display job status attributes
     2. Display job definition attributes
     3. Display job run attributes, if active
     4. Work with spooled files

    10. Display job log, if active or on job queue
    11. Display call stack, if active
    12. Work with locks, if active
    13. Display library list, if active
    14. Display open files, if active
    15. Display file overrides, if active
    16. Display commitment control status, if active
                                                                      More...
Selection or command
===> ____________________________________________________________________________

F3=Exit   F4=Prompt   F9=Retrieve   F12=Cancel
```

Figure 195. Work with Job

Then type option **4** and press **Enter** to work with spooled files. Then use option **5** to display each file to see the detailed messages. If the profile is not in status

OUTQ, you may also use option **10** and then **F10** to see the job log information of the job controlling the active point-to-point session.

It depends on the job description QTOCPPJOBD whether the job log is written to a spooled file or not. Depending on that you will see the status `OUTQ` or `INACTIVE` after the connection was ended. If you need to perform problem determination, it is very helpful to keep the job log in a spooled file for analysis. If the status always returns to INACTIVE and therefore you do not find any job log, you may use the *Change Job Description* (CHGJOBD) command by typing the following in any AS/400 command line:

```
CHGJOBD JOBD(QTOCPPJOBD) LOG(4 00 *SECLVL)
```

Vice versa, you may disable the capability of printing job logs in a stable environment through this command:

```
CHGJOBD JOBD(QTOCPPJOBD) LOG(4 00 *NOLIST)
```

However, if you do so, you may not be able to determine he cause of problems, after the connection has ended.

The job log is not the only useful spool file produced by the connection job. A spool file with the same name as the connection profile (`PPPDOMSVR` in our example) is written to the default system printer. If the connection was successfully started and ended, this spooled file will disappear, however, if the case of problems or while the connection is active, it may provide some good information. Figure 196 shows an example of the PPP connection log.

```
                          Display Spooled File
File  . . . . . :   PPPDOMSVR                      Page/Line   1/6
Control . . . . .   ________                       Columns     1 - 78
Find  . . . . . .   ___________________________
*...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+...
21:51:35.930 === Attempting modem reset.
21:51:35.931 ==> AT&FS0=0
21:51:35.934 === Reading modem response.
21:51:36.699 <== AT&FS0=0
21:51:36.699 ... OK
21:51:36.708 === Attempting modem initialization.
21:51:36.708 ==> AT&SF1&D2&C1X4V1Q0S7=70$BA0$MB33600&S1
21:51:36.723 === Reading modem response.
21:51:37.427 <== AT&SF1&D2&C1X4V1Q0S7=70$BA0$MB33600&S1
21:51:37.427 ... OK
21:51:37.431 === Attempting modem dial/answer.
21:51:37.436 ==> ATDT56390
21:51:37.985 <== ATDT56390
21:51:37.987 === Reading modem response.
21:52:07.877 <== CONNECT 28800 LAPM COMPRESSED
21:52:07.881 === Establishing point-to-point connection for profile PPPDOMSVR.
                                                                        More...
F3=Exit   F12=Cancel   F19=Left   F20=Right   F24=More keys
```

Figure 196. PPP Connection Log

Chapter 8
Migration From Other Domino Platforms

For a number of reasons, you may wish to migrate to Domino for AS/400 Release 4.6.x[1] from other platforms such as Windows NT or OS/2, or the implementation of Lotus Domino on the IBM Integrated PC Server. These reasons include:

- Higher reliability and availability of an AS/400 system compared to a PC server
- Consolidation of smaller capacity servers to a single highly scalable environment
- Enhanced integration with AS/400 services and DB2 for AS/400 data
- Announced lack of future support for Domino on your existing server implementation
- Low total cost of ownership

Since there are as many issues and approaches to migration as there are motivations and unique environments, this chapter is not meant to be a step by step cookbook. Rather, it is a set of tips and techniques to assist you in planning and to educate you about common issues and pitfalls based on experience.

The AS/400 implementation of Lotus Domino on an AS/400 Integrated PC Server is officially called *OS/400 Integration of Lotus Notes.* OS/400 V4R3 is the last AS/400 operating system release to support this implementation. This specific Integrated PC Server platform offers some unique integration and functions in comparison to an outboard OS/2 Domino server or a Domino server installed on the new Integrated PC Server with Windows NT. This uniqueness provides special migration challenges which will be discussed in this chapter separately from the general migration considerations.

Note In this chapter, the phrase Integrated PC Server implementation refers to OS/400 Integration of Lotus Notes, rather than a Domino server installed on an Integrated PC Server with Windows NT.

Changes in this Chapter

This chapter is completely new and not part of the published version of the redbook SG24-5181-00.

[1] Migration to the new database architecture of Lotus Domino 5.0 is beyond the scope of this book. Please refer to product documentation.

Additional modifications:
On page 345: The sequence of steps 4 and 6 within the migration process has been changed so that the step to copy the files from the existing Integrated PC Server to the new data directory for Lotus Domino for AS/400 (described in detail on page 352) precedes now the task to create a new network server description.

General Approaches to Domino Server Migration

Two possible approaches to meet the objective of migrating a Domino server are *server transplantation* and *server consolidation*. The experience on which these guidelines are based comes from the IBM Rochester Information Services migration (see Appendix B), business partner experience, migration services engagements, and laboratory testing in the ITSO.

Server transplantation means moving a Domino server from one platform to another while keeping the same Domino identity and IP address. The Domino identity includes the server's full hierarchical name and encryption keys as stored in its ID file. The primary advantage of this method is that nothing is changed within the Domino configurations, and no modifications are required to the Notes clients accessing the server.

A disadvantage is that since two servers with the same identity and IP address cannot both be active at the same time in the same network, a server outage for some period of time is necessary.

Server consolidation involves changing the Domino and network identity of at least one server in the move from one platform to another, often merging workload of two or more servers into one. An advantage of this method, even in migrating just one server, is that the original and the new server can both remain concurrently active for a limited period of time.

A major disadvantage is that it involves change of user information in the Public Address Book (formerly called Name and Address Book) and changes to database icons and location documents on the users' workstations to reflect the server change. Also, a different Domino identity means a different encryption key, so locally encrypted mail files require special handling in order for the new server to be granted appropriate access.

Special considerations beyond the basic migration process may be involved if any of the following are a part of your environment:

- Migration from a server with Domino Release 4.5 or earlier
- Migration of the SMTP/MIME MTA
- Use of connection documents for replication or mail routing on the Integrated PC Server

- Functions unique to the Integrated PC Server implementation of Domino
- Domino applications dependent on interfaces or functions specific to a particular operating system

Guidelines to address some of these considerations are covered in this chapter. In cases where details are beyond the scope of this book, references to further information are provided.

Server Transplantation Process Outline

The server transplantation method, preserving the server's identity, is desirable in many cases as a way to move a bulk of users rapidly with minimal user disruption. It may be used as an initial phase even when consolidation of multiple servers is the final goal. The overall process is as follows:

1. Identify the Domino databases and other files to be migrated.
2. Create the Domino data directory for the new Domino for AS/400 server.
3. Schedule an outage of original Domino server long enough to transfer databases to be migrated.
4. Copy the id files, the Public Address Book (NAMES.NSF), mail and other Domino databases to be migrated into the data directory using FTP, the AS/400 "network neighborhood" capability, or any other available copy method.
5. Change ownership of files and directories to the QNOTES user profile and change the public authorities.
6. Add the original IP address as a new TCP/IP interface on the AS/400 system, and change the network identity of the original server by creating a new network server description or changing the existing one.
7. Configure the Domino for AS/400 server, specifying *FIRST server and paths to the copied id files. (If migrating the SMTP/MIME MTA, do not configure the MTA at this time. See instructions in “Migrating the SMTP/MIME MTA” on page 371.)
8. Start the TCP/IP interface and the new Domino server on the AS/400 system. Because it has the same name and TCP/IP address, the server change should be transparent to the users.

There may be variations of the steps and the sequence you may perform them, which may be successful as well. We found the steps as described above, provide the most convenient and secure way to migrate a Domino server in most cases. For a migration from an Integrated PC server it is important to copy the files (step 5) before creating a new network server description in step 6 to allow access to the Domino data directory through FTP.

The following topics describe each of the migration tasks.

Identify the Domino Databases and Files to be Migrated

First, you need to determine which databases and files will actually be migrated at this time. This task may sound simple at first, but it requires careful planning.

You should not blindly copy the entire contents of the Domino data directory. In addition to containing Domino databases, the Domino data directory also contains files specific to the existing operating system implementation and release of Domino, for example, modem files, documentation and configuration databases, and database templates. In most cases, in your new environment you will want documentation and configuration files specific to Domino for AS/400.

In other cases, you may want to carry over some of the original files. For example, if database templates have been customized, you will wish to copy those as well. The issue of templates in general is particularly important if your applications are based on design templates from an earlier release of Domino. If any of your databases automatically inherit the design from the templates, you should either copy the original templates along with the databases or turn off the automatic inheritance. Otherwise, a Domino 4.6.x template with the same name may render design changes that may potentially cause problems for client workstations running an earlier release of Lotus Notes.

Do Not Migrate Full Text Indexes

For each Domino database set up for full text indexing, the data directory also contains up to nine subdirectories with files for the indexes, each of those containing several files. Although you will want the indexes in the new environment, it may take less time to recreate the indexes after copying the databases than to copy the full text index files. This is especially true if you use FTP to transfer the database. Since the content of each subdirectory has to be created and copied individually, not copying the full indexes may substantially reduce the number of manual steps to be performed.

Directories containing full text indexes can easily be identified by an extension of `.ft`. For example if the name of your Domino database is `EUTALK.NSF`, then Domino data directory would could contain a subdirectory called `EUTALK.`ft. An example is shown in Figure 197, where we used the *Submit Network Server Command* (SBMNWSCMD) command to a Domino database together with the index directory on the K: drive of an Integrated PC Server.

```
                                Command Entry                        SYSTEM01
                                                          Request level:   1
All previous commands and messages:
     Command submitted to server NTSIPCS.
   > SBMNWSCMD CMD('dir K:\Notes\data\EUTALK.*') SERVER(NTSIPCS) CMDTYPE(*OS2)

     The volume label in drive K is NTSIPCS_K.
     The Volume Serial Number is FB23:B000.
     Directory of K:\Notes\data

      5-16-97  12:36p     <DIR>           0  EUTALK.ft
     11-12-98   9:54p    573440           0  EUTALK.NSF
             2 file(s)     573440 bytes used
                          56493056 bytes free
     Command submitted to server NTSIPCS.
                                                                      Bottom
Type command, press Enter.
===> ____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
F3=Exit   F4=Prompt   F9=Retrieve   F10=Exclude detailed messages
F11=Display full      F12=Cancel    F13=Information Assistant   F24=More keys
```

Figure 197. Directories for Databases with Full Text Index

Since it is very easy to create a full text index from scratch using a client accessing the server after the migration, it is probably not worth the effort to copy the entire subdirectory structure for each database with full text index. If you are currently running Domino on an Integrated PC Server, you may submit the following command from any AS/400 command line to find out about all databases with full text index:

```
SBMNWSCMD CMD('dir K:\*.ft /s') SERVER(NTSIPCS) CMDTYPE(*OS2)
```

Where `NTSIPCS` must be replaced by the name of your Integrated PC Server.

Testing the Domino Applications Before Migrating

Any applications that you plan to migrate should be tested with Domino for AS/400 prior to actual migration. This testing may be accomplished by setting up a server using an IP address which is not registered on the DNS name server with the Domino server's name as IP host name. The administrator or other persons who test the application would than add the IP address to their client's HOSTS file to be able to access the test server without connecting to the existing production environment. Before starting the test, you should disable all replication or mail routing in the connection documents on the test server.

To migrate Domino applications for testing purposes, you should use the consolidation method, as described in "Server Consolidation Process Outline" on page 367, even though you might use the transplantation method for the actual migration of the production environment after completing the tests and deleting the test server.

Compatibility of Domino Applications

Generally, Domino applications are designed to be cross platform. If the application is a standard Domino application, it will usually run unchanged on the AS/400 platform. However, since there are exceptions to every rule, testing is necessary. Here are the general guidelines for cross-platform portability without modification:

- The application has been created using only the tools that come as part of Domino - no Visual Basic, no C or C++, no outside influencing wrappers.
- The application consists only of Domino databases (NSF files) - no external, operating system related DLLs.
- The application is independent of the services of a specific operating system.

Some of the exceptions requiring minor modification are addressed in an article entitled "Porting Domino Applications to AS/400" in the May 1998 Wellesley Information Systems Business Partner Special Report. The text is available on the Web at the following URL:

`http://www.eview.com/eview/view.nsf/pages/as400dev`

The special cases explained in the article include:

- Difference in path delimiter when accessing databases on the server - the AS/400 syntax (as well as UNIX) uses a forward slash (/), while PC operating systems use a back slash (\)[2].
- Differences in the use of LotusScript:Data Object (LS:DO) instructions
- Unsupported LotusScript instructions
- Differences in C, C++, and HiTest C APIs

Applications significantly integrated with the services of a particular operating system will most likely require a significant amount of modification. You may choose to keep those specific applications running on their existing platform.

Note Some Lotus companion products that run with Domino are written specifically to the services of a specific operating system and do require development effort to port to the AS/400 platform. Some of these, such as Domino.Doc, are now available on the AS/400 system.

Create the Domino Data Directory for the Domino for AS/400 Server

Although it is not absolutely necessary to create the Domino data directory first (since the Domino for AS/400 server configuration process can create it for you), you may choose to do so for more control over what is adopted from the existing environment.

---

[2] Domino for AS/400 tries to accommodate this difference as much as possible in accepting either of the two slash types in most cases. However, when retrieving a path name, forward slashes will be delivered. If an application specifically checks for a backslash, it needs to be modified.

In a migration scenario, you will want to use existing ID files for your organization certifier, the Domino server you are migrating, and the administrator user. This means that you need to copy those id files from your existing environment to a work area with path accessible to the Domino for AS/400 configuration process.

You also need to set up the configuration to use the existing Public Address Book (NAMES.NSF) for your Domino domain without registering an additional server. This is because the transplantation method assumes the existing Domino server identity will be moved to the new server platform.

Thus, you will perform *Configure Domino Server* (CFGDOMSVR) with the option *FIRST even though this Domino for AS/400 server is technically not the first server in your organization. Otherwise, if you choose option *ADD, the configuration process will access the Public Address book on an existing server. This may not be possible because Domino on the Integrated PC Server cannot be active at the same, nor is it desirable, because we already copied all databases including the Public Address Book.

By default, CFGDOMSVR with option *FIRST generates ID files and creates a new Public Address Book. To override the default for generation of id files, you can provide the path and file names of existing ID files in place of the keyword **`*GEN`**. That path can be any accessible path in the AS/400 Integrated File System. However, a new Public Address Book will be created unless one already exists in the specified Domino data directory. This is why we recommend creating the data directory manually and copying the files prior to configuring the Domino for AS/400 server.

An alternative would be to let the configuration process generate the ID files, Public Address Book or both, and then replace them with selected files from the existing environment. If you do this, you need to be very careful to avoid confusion between the true production files and the ones created by the configuration process that are essentially invalid in your live environment.

You would also need to remember that FTP does not automatically replace existing files of the same name in the target directory. It also does not notify you that a file of the same name exists. In order to use the original Public Address Book rather than one automatically generated, you would need to overtly specify the "replace" parameter on the FTP command.

Thus, for simplicity and control, it is usually safer to manually create the Notes data directory before copying the files and configuring the new Domino server, and use it as the repository for the ID files as well as the Public Address Book.

Below are the steps to create the directory structure in the root of the AS/400 Integrated File System. Our example uses **`notes/data`**, which is the default for most Domino servers.

Note The path delimiter for AS/400 Integrated File System is a forward slash, not a backslash.

It is best to use the same naming convention as your existing Domino server. An exception to this rule is if there is already a Domino for AS/400 server on the target AS/400 system that already uses the existing naming convention, and this new server is another partitioned server, or you are planning to implement partitioned servers in the future. In this case we recommend using the name of the server in the path instead of the word **data**, since the Domino data directory must be unique for each partition.

1. On an AS/400 command line, type the following command:
   ```
   CRTDIR[3] '/notes'
   ```
   Press the **Enter** key.

2. On an AS/400 command line, type:
   ```
   CRTDIR '/notes/data'
   ```
   Or, if you decided to use the suggested naming convention, you may type:
   ```
   CRTDIR '/notes/servername'
   ```
   Press the **Enter** key.

3. Create any subdirectories you may have in your existing environment. For example, mail databases are usually in a subdirectory called mail. To create a directory for it, on an AS/400 command line, type:
   ```
   CRTDIR '/notes/data/mail'
   ```
   Or, if you decided to use the suggested naming convention, you may type:
   ```
   CRTDIR '/notes/servername/mail'
   ```
   Press the **Enter** key.

In order for Domino for AS/400 to access Domino databases and manage access by users, the newly created directory structure must be owned by the user profile QNOTES. Thus, you must change the ownership of these directories.

To change the ownership of a directory, you use the *Change Owner* (CHGOWN) command. In our example, the Domino data directory is called `/notes/data`:

```
CHGOWN '/notes/data' QNOTES
```

Note This command changes the ownership for the specified directory, but does not affect subdirectories. You must issue a change ownership command specifically for each of the directories and subdirectories you have created for Domino for AS/400.

Changing ownership sets the appropriate authorities for the QNOTES user profile at the same time. However, to ensure data security and integrity, you should

---

[3] You may also use the MD command, which is a short version of the *Create Directory* (CRTDIR) command. Except for the shorter name, there is no difference between the commands.

change the public data authority for these directories to ***EXCLUDE**. To do this, you use the *Change Authority* (CHGAUT) command.

For example, type:

```
CHGAUT '/notes/data' USER(*PUBLIC) DTAAUT(*EXCLUDE)
           OBJAUT(*NONE)
```

Press the **Enter** key. A message appears at the bottom of the display indicating "Object Changed."

As in the case of changing ownership, you must issue a *Change Authority* (CHGAUT) command for each of the directories and subdirectories you have created for Domino for AS/400.

Schedule an Outage of the Original Domino Server

With the server transplantation method, the original Domino server needs to be down for a period of time to copy the Domino data files and transfer the network identity. This is to avoid updating of files (particularly volatile mail files) while the transfer is taking place. Once the TCP/IP network identity has been moved to the AS/400 system, both servers cannot be concurrently active with the same address in the same network.

Copy the Domino Databases and Files to the Transplanted Server

The next step is to actually copy the ID files, Public Address Book, mail databases, and other Domino databases and files to be migrated. The target will be the Domino data directory you created above. This can be done using FTP or the "network neighborhood" capability provided by AS/400 Client Access.

FTP is usually the desired method for optimum performance when copying large amounts of data. However, FTP does not allow you to copy the contents of all subdirectories with a single put command. Therefore a put command is necessary for each subdirectory, which may be cumbersome and error prone if the server has a complicated subdirectory structure. In such an environment it is very helpful that multiple FTP commands can be queued up in batch using a source file.

Also for individual files which may be stored on the administrator's workstation or diskettes, such as the certifier ID and administrator user ID files, the Client Access method may be more convenient.

Important If you used FTP many times, you may already know all the steps described here. However, make sure to understand step 6. on page 353 needs to be included because of a modification of the FTP protocol which was introduced with V4R2 of OS/400.

Here is the general process for setting up the FTP environment:

1. Verify your FTP id and password on the original system (the system from which you are migrating) by accessing the TRUSERS (trusted users) file. If the

original system is an Integrated PC Server, look for the file E:\MPTN\ETC\TRUSERS.

If you have not configured FTP on your Integrated PC Server, this file will not yet exist. However, a sample file called TRUSERS.SMP is provided. This sample TRUSERS file has a sample user ID (admin) and password (adminpwd) already configured, which can be used to log on the first time.

You can create the TRUSERS file on the E: drive from this sample file by entering the following command on any AS/400 command line[4]:

```
SBMNWSCMD CMD('COPY F:\FSNOTES\ADMIN\TRUSERS.SMP
E:\MPTN\ETC\TRUSERS') SERVER(NWSD_name) SVRTYPE(*BASE)
```

2. Start the FTP server on the original system. If the original system is an Integrated PC Server, this is done by typing the following *Submit Network Server Command* (SBMNWSCMD) command on an AS/400 command line:

   ```
   SBMNWSCMD CMD('XFTPD ON') SERVER(NWSD_name)SVRTYPE(*BASE)
   ```

   where server_name is the name of your Domino server.

   Press the **Enter** key.

Note You will not receive any confirmation message. However, if you do not see any error messages, it indicates that FTP has been started on the Integrated PC Server. You can verify that FTP is active by using the following command:

```
SBMNWSCMD 'netstat -s' NWSD_name  SVRTYPE(*BASE)
```

3. Connect to the original system to transfer your data. On the AS/400 command line, type the following command and press the **Enter** key:

   ```
   FTP 'IP_Address'
   ```

Note If the original system is an Integrated PC server, IP_Address should be the internal bus port TCP/IP Address of your Integrated PC Server for best performance.

Tip To find out the IP address of the internal bus port, you can use the *Display Network Server Description* (DSPNWSD) command:

```
DSPNWSD NWSD_name
```

where NWSD_name is the Network Server Description name of your Integrated PC Server.

4. An AS/400 File Transfer Protocol display appears. In response to the prompts, enter the FTP user ID and password you obtained in step 1. on page 352. FTP indicates the user is logged in and prompts you for an FTP subcommand.

---

[4] If your Integrated PC Server resides on a different AS/400 system, it may be on a release older than V4R2. Note that in V3R2 or V3R7 the file TRUSERS.SMP was provided in a different directory. Therefore the correct command would be in this case: **SBMNWSCMD 'COPY D:\MPTN\BIN\TRUSERS.SMP E:\MPTN\ETC\TRUSERS' NWSD_name SVRTYPE(*BASE)**

5. Change the mode of transfer to binary. On the AS/400 FTP command line, type:

   `binary (or the short form bin)`

   Press **Enter** and FTP issues a confirmation message "200 Type set to I (Image/Binary)".

6. Toggle off passive data connection transfer mode if the original system does not support it. Integrated PC Server, for example, does not support passive data connection, which is on by default. If you don't change the transfer mode, you'll see an error message, e.g., "Error 425 can't open data connection." On the AS/400 FTP command line, type:

   `sendpa`

   Press **Enter** and FTP issues a confirmation "SENDPASV is off."

7. Change the name format to 1. This allows us to work with the entire AS/400 Integrated File System (IFS), or in other words the root file system instead of the library file system (QSYS.LIB) which is only a subset. On the AS/400 FTP command line, type:

   `na 1`

   Press the **Enter** key. FTP issues a confirmation "Client NAMEFMT is 1."

8. Working from your identified list of files to be migrated, use the appropriate FTP commands to copy individual files, multiple files of the same type from a particular directory, or all files from a particular directory.

   Tip Use LCD (Local Change Directory) to change directory on the local (AS/400) system. Use CD (Change Directory) to change directory on the original system, which may be an Integrated PC Server. Use GET for individual files and MGET for multiple files.

   More specific examples with command syntax are included below:

w To copy all files from a particular subdirectory of this Domino data directory (in our example, from the mail subdirectory with the option to replace existing files of the same name in the target directory), type the following commands on the AS/400 FTP command line:

`LCD /notes/data/mail`

`CD k:\notes\data\mail`

`MGET *.* (replace`

w To copy multiple files of the same type (for example, with extension NSF) from a user subdirectory of this Domino data directory, type the following commands on the AS/400 FTP command line:

`LCD /notes/data/johndoe`

`CD k:\notes\data\johndoe`

```
MGET *.nsf
```

9. Repeat the previous step for each subdirectory you need to copy.
10. When you are finished copying files, quit FTP. On the AS/400 FTP command line, type:

    ```
    QUIT
    ```

    Press the **Enter** key.
11. Verify that you have copied all the files to be migrated, plus the certifier ID, server ID, and administrator user's id to the Domino data directory on the AS/400 system.

Automating the File Transfer with a CL Program

If you need to transfer many subdirectories, you may want to automate the copy process by writing a CL program. While you easily may combine all CL commands to create the directory structure into a CL program, as shown in lines 2.00 through 7.00 of Figure 198, it is not very obvious how to automate the FTP process. The trick is to create a separate source file member containing all FTP subcommands in the sequence as they need to be entered. On our example we named the member `FTPINPUT` and added it to the standard source file for CL programs QCLSRC.

```
 Columns . . . :    1  71           Edit                              WBL/QCLSRC
 SEU==> _____________________________________________________________ FTPFRMIPCS
 FMT **  ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7
       ********** Beginning of data *************************************
0001.00 PGM
0002.00  CRTDIR '/NOTES/DATA/doc'    DTAAUT(*EXCLUDE) OBJAUT(*NONE)
0003.00  CRTDIR '/NOTES/DATA/lspace' DTAAUT(*EXCLUDE) OBJAUT(*NONE)
0004.00  CRTDIR '/NOTES/DATA/MAIL'   DTAAUT(*EXCLUDE) OBJAUT(*NONE)
0005.00  CHGOWN '/NOTES/DATA/doc'    NEWOWN(QNOTES)
0006.00  CHGOWN '/NOTES/DATA/lspace' NEWOWN(QNOTES)
0007.00  CHGOWN '/NOTES/DATA/MAIL'   NEWOWN(QNOTES)
0008.00
0009.00  SBMNWSCMD 'XFTPD ON'  SERVER(IPCS1) SVRTYPE(*BASE) CMDTYPE(*OS2)
0010.00
0011.00  OVRDBF FILE(INPUT)  TOFILE(*LIBL/QCLSRC) MBR(FTPINPUT)
0012.00  OVRDBF FILE(OUTPUT) TOFILE(*LIBL/QCLSRC) MBR(FTPOUTPUT)
0013.00  FTP      RMTSYS('192.168.3.2')
0014.00
0015.00  SBMNWSCMD 'XFTPD OFF' SERVER(IPCS1) SVRTYPE(*BASE) CMDTYPE(*OS2)
0016.00 ENDPGM

 F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F10=Cursor   F11=Toggle
 F16=Repeat find       F17=Repeat change          F24=More keys
```

Figure 198. CL Program to Automate Data Transfer Through FTP

Before coding the FTP command, you need to use an *Override with Data Base File* (OVRDBF) command to redirect the standard input file - by default the keyboard - to the source file member `FTPINPUT` (line 11.00 in Figure 198). Figure 199

shows the content of the file member.

```
Columns . . . :    1  71           Edit                              WBL/QCLSRC
 SEU==> _____________________________________________________________  FTPINPUT
 FMT **  ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7
        ********** Beginning of data ************************************
0001.00 admin adminpwd
0002.00 CD /
0003.00 bin
0004.00 sendpa
0005.00 NA 1
0006.00 LCD   /NOTES/DATA/doc
0007.00 cd  k:\notes\data\doc
0008.00 MGET *.* (replace
0009.00 LCD   /NOTES/DATA/lspace
0010.00 cd  k:\notes\data\lspace
0011.00 MGET *.* (replace
0012.00 LCD   /NOTES/DATA/MAIL
0013.00 cd  k:\notes\data\MAIL
0014.00 MGET *.* (replace
0015.00 QUIT
        ****************** End of data ***************************************

 F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F10=Cursor   F11=Toggle
 F16=Repeat find       F17=Repeat change          F24=More keys
                                        (C) COPYRIGHT IBM CORP. 1981, 1998.
```

Figure 199. Input File for FTP Utility

Likewise the standard output is redirected to member FTPOUTPUT in line 12.00 of Figure 198. The content of this member can be used for debug and control purposes after transferring the data. An example is shown in Figure 200.

```
 Columns . . . :    1  71           Browse                        NOTESLAB/QCLSRC
 SEU==> _____________________________________________________________  FTPOUTPUT
 FMT **  ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7
0017.00 SENDPASV is off.
0018.00 Enter an FTP subcommand.
0019.00 > NA 1
0020.00 202 SITE not necessary; you may proceed.
0021.00 Client NAMEFMT is 1.
0022.00 Enter an FTP subcommand.
0023.00 > LCD   /NOTES/TEST/doc
0024.00 Local working directory is /NOTES/TEST/doc
0025.00 Enter an FTP subcommand.
0026.00 > cd  k:\notes\data\doc
0027.00 250 CWD command successful.
0028.00 Enter an FTP subcommand.
0029.00 > MGET *.* (replace
0030.00 200 Type set to A.
0031.00 200 PORT command successful.
0032.00 150 Opening ASCII mode data connection for *.*.
0033.00 226 Transfer complete.

 F3=Exit   F5=Refresh   F9=Retrieve   F10=Cursor   F11=Toggle   F12=Cancel
 F16=Repeat find        F24=More keys
```

Figure 200. FTP Log Redirected to Source File Member

Time Needed for Transferring the Data

The speed of data transfer is certainly dependent on many factors like size and utilization of your AS/400 system, the network speed, the CPU speed of the existing server. For an example with a small amount of data transferred between an Integrated PC Server and OS/400, see the FTP log shown in Figure 201.

```
Columns . . . :    1  71           Browse                      NOTESLAB/QCLSRC
 SEU==> _____________________________________________________________ FTPOUTPUT
 FMT **  ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7
0034.00 200 Type set to I (Image/Binary).
0035.00 200 PORT command successful.
0036.00 150 Opening BINARY/IMAGE mode data connection for HELPADMN.NSF (5870592
0037.00 226 Transfer complete.
0038.00 5870592 bytes transferred in 8.793 seconds. Transfer rate 667.646 KB/se
0039.00 200 PORT command successful.
0040.00 150 Opening BINARY/IMAGE mode data connection for INTERNET.NSF (3351040
0041.00 226 Transfer complete.
0042.00 3351040 bytes transferred in 4.131 seconds. Transfer rate 811.221 KB/se
0043.00 200 PORT command successful.
0044.00 150 Opening BINARY/IMAGE mode data connection for MIGRATE.NSF (1261056
0045.00 226 Transfer complete.
0046.00 1261056 bytes transferred in 2.008 seconds. Transfer rate 628.075 KB/se
0047.00 200 PORT command successful.
0048.00 150 Opening BINARY/IMAGE mode data connection for SRVINST.NSF (621056 b
0049.00 226 Transfer complete.
0050.00 621056 bytes transferred in 0.894 seconds. Transfer rate 695.040 KB/sec

 F3=Exit   F5=Refresh   F9=Retrieve   F10=Cursor   F11=Toggle   F12=Cancel
 F16=Repeat find        F24=More keys
```

Figure 201. FTP Performance Between IPCS and OS/400 via Internal LAN

Note The speed may very substantially on your system, so you should test the transfer in order to be able to estimate the time needed. Remember, neither the old nor the new Domino server will be available for users during this period of time.

Change Ownership and Authorities of Files and Directories

In order for Domino for AS/400 to access Domino databases and manage access by users, the files must be owned by the specialized user profile QNOTES. Thus, you must change the ownership of the files just transferred and the directory structure in which they reside.

You may have already performed this step for the directory structure at the time you created it. If not, to change the ownership of a directory, you can use the *Change Owner* (CHGOWN) command. In our example, the Domino data directory is called `/notes/data`:

```
CHGOWN '/notes/data' QNOTES
```

You still need to change ownership and authorities of the files you just transferred. To change the ownership of all files in a given directory, you can use the *Change Owner* (CHGOWN) command syntax as indicated below. In our example, the Domino data directory is called `/notes/data`:

```
CHGOWN '/notes/data/*' QNOTES
```

Note This command changes the ownership for all files in the specified directory, but does not affect subdirectories and the files they contain. You must issue a change ownership command specifically for each of the directories and subdirectories you have created for Domino for AS/400.

Tip Use the **F9** key to recall the CHGOWN command, use **F4** to prompt, and then edit as appropriate. Alternatively, these commands can be included in a CL program.

Changing ownership sets the appropriate authorities for the QNOTES user profile at the same time. However, as an added security measure, you will also want to change the public data authority for these files and directories to *EXCLUDE. To do this, you use the *Change Authority* (CHGAUT) command.

For example, type:

```
CHGAUT '/notes/data/*' USER(*PUBLIC) DTAAUT(*EXCLUDE)
           OBJAUT(*NONE)
```

Press the **Enter** key. A message appears at the bottom of the display indicating "Object Changed."

As in the case of changing ownership, you must issue a change authority command for each of the directories and subdirectories you have created for Domino for AS/400.

Modify the TCP/IP Configuration of Both Servers

You will need to add the original server's IP address as a new TCP/IP interface on your AS/400 system, and change the network identity of the original server. For details about configuring an AS/400 TCP/IP interface, please refer to “Configure TCP/IP on Your AS/400 System” on page 42.

Before adding the original server IP address as a new AS/400 TCP/IP interface, you need to end the TCP/IP interface of the original server. If the original server is an Integrated PC Server, this is done using option 1 of the *Work with TCP/IP Network Status* (NETSTAT) command. You also need to vary off the Integrated PC Server using option 2 in the *Work with Configuration Status* (WRKCFGSTS) display or the *Vary Configuration (*VRYCFG) command.

Changing the network identity of the original server involves changing its IP address in the TCP/IP configuration. If the original server is an Integrated PC Server, you can change its network identity in one of two ways:

- Change the external IP address on the existing Network Server Description (NWSD).
- Create a new NWSD for the Integrated PC Server with a new name and a new external IP address.

The method you choose is primarily determined by whether the Integrated PC Server also supports applications or interfaces which rely on the original NWSD name.

Many customers may want to change the name of the NWSD for the Integrated PC Server for administrative convenience and clarity. For example, you have a Domino installation on your Integrated PC Server whose NWSD is named DOMINO1, because it was primarily or solely intended as a Domino server. After you migrate to Domino for AS/400, your Integrated PC Server is likely to be no longer used for Domino. It may be used as a firewall or LAN adapter or for other network applications.

Thus, keeping the original NWSD name (for example, DOMINO1) is no longer appropriate and may in fact be confusing. In many cases, the potential confusion may be further complicated by the fact that the Domino server name may be the same as the NWSD name. Hence we expect most organizations will prefer to simply create a new NWSD for their Integrated PC Server with a new name (for example, IPCS1) and then create new line descriptions for the new NWSD.

Note If you do not plan to use the Integrated PC Server for other Network Server implementations, like a firewall or a LAN server, you may also use it as a normal LAN adapter for your AS/400 applications. If you decide to do so, you still need to follow the instructions give below to move the IP address from the Integrated PC Server to an AS/400 IP interface, even if you plan to use the same physical adapter.

The following section shows how to create a new NWSD. If you prefer to use the existing NWSD, go to “Using the Same Network Server Description” on page 362.

Creating a Network Server Description with a New Name

To create a new NWSD for the Integrated PC Server with a new name and external IP address, follow these steps:

1. On an AS/400 command line, type:
   WRKNWSD

Press **Enter** and the Work with Network Server Descriptions display as shown in Figure 202 appears.

```
                    Work with Network Server Descriptions
                                                              System:   SYSTEM01
Type options, press Enter.
  1=Create   2=Change   3=Copy   4=Delete   5=Display   6=Print
  9=Retrieve Source...

        Network
Opt     Server       Text

__      __________
3       DOMINO1      IPCS with Lotus Domino
__      NTJAREK      BACK Office Workshop residency TEST
__      NTSIPCS      Domino Intro Hands-On Lab


                                                                       Bottom
Parameters or command
===> ____________________________________________________________________________
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F17=Position to
F23=More options      F24=More keys
(C) COPYRIGHT IBM CORP. 1980, 1998.
```

Figure 202. Work with Network Server Descriptions

2. Find the Network Server name that matches your Integrated PC Server. (In our example, it is "DOMINO1") Tab down to the corresponding field under the Opt column and type a "3" to Copy the description. Press **Enter** and the *Create Network Server Description* (CRTNWSD) prompt as shown in Figure 203 appears.

```
                      Create Network Server Desc (CRTNWSD)

Type choices, press Enter.

Network server description . . .   IPCS1        Name
Resource name  . . . . . . . . . > CC07         Name
Network server type  . . . . . . > *BASE        Character value...
Online at IPL  . . . . . . . . . > *NO          *YES, *NO
Vary on wait . . . . . . . . . . > *NOWAIT      *NOWAIT, 1-15 minutes
Language version . . . . . . . . > 2924         *PRIMARY, 2963, 2966, 2980...
Country code . . . . . . . . . . > 1            *LNGVER, 001, 002, 031, 033...
Code page  . . . . . . . . . . . > 850          *LNGVER, 437, 850, 852, 857...
NetBIOS description  . . . . . . > QNTBIBM      Name, QNTBIBM
Server message queue . . . . . . > *JOBLOG      Name, *JOBLOG, *NONE
  Library  . . . . . . . . . . .                Name, *LIBL, *CURLIB
Configuration file . . . . . . . > *NONE        Name, *NONE
  Library  . . . . . . . . . . .                Name, *LIBL, *CURLIB
Start NetBIOS  . . . . . . . . . > *YES         *YES, *NO
Start TCP/IP . . . . . . . . . . > *YES         *NO, *YES

                                                                       More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 203. Create Network Server Description (CRTNWSD)

3. Type in a new name for your Integrated PC Server. In our example, the new name for the Integrated PC Server is IPCS1.

   Page down and a second command prompt as shown in Figure 204 appears.

```
                    Create Network Server Desc (CRTNWSD)

Type choices, press Enter.

TCP/IP port configuration:
  Port . . . . . . . . . . . . . > 1          *NONE, *INTERNAL, 1, 2, 3
  Internet address . . . . . . . > '10.5.67.73     '
  Subnet mask  . . . . . . . . . > '255.255.255.192'
  Maximum transmission unit  . . > 1500        Number

  Port . . . . . . . . . . . . . > 2          *INTERNAL, 1, 2, 3
  Internet address . . . . . . . > '10.5.67.74     '
  Subnet mask  . . . . . . . . . > '255.255.255.0  '
  Maximum transmission unit  . . > 1500        Number

  Port . . . . . . . . . . . . . > *INTERNAL   *INTERNAL, 1, 2, 3
  Internet address . . . . . . . > '192.168.7.2    '
  Subnet mask  . . . . . . . . . > '255.255.255.0  '
  Maximum transmission unit  . . > 15400       Number

                                                                    More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 204. Create Network Server Description (CRTNWSD) - 2. Prompt

4. If an Internet address is defined for port 1, type in a new Internet address for TCP/IP port 1. In our example, the original address was '10.5.67.71' and we changed it to '10.5.67.73'. The IP address must be unique within your network and conform to your subnet mask. For a larger network, you may need to consult your network administrator to obtain an appropriate new IP address for your installation.

   If an Internet address is defined for port 2, type in a new Internet address for TCP/IP port 2. In our example, the original address was '10.5.67.72' and we changed it to '10.5.67.74'.

   Note An Integrated PC Server configured for Domino always has one internal port (showing `*INTERNAL` in the Port parameter), and one or two external ports[5]. There is no need to change the internal IP address; depending on the future usage[6] of the Integrated PC Server, the internal port may or may not be needed. If the Domino server uses both external ports, you need to change each, as in our example. If only one port was used, it will be port 1 in most cases, but could as well be port 2.

---

[5] A reason for using two ports would be one port connects to a Token Ring, the other one to an Ethernet, or you may have 4 MB and a 16MB Token Ring.

[6] For example, if the Integrated PC Server is used to implement a firewall, the internal port needs to be used. If the Integrated PC Server is used as a LAN adapter for AS/400 applications, the internal port is no longer needed.

Press the **Enter** key. A message appears indicating "Operation in progress, please wait."

5. The Work with *Network Server Descriptions* display will reappear. A message at the bottom of the display should confirm your action. In our example, the message states, "Network Server Description IPCS1 created."
6. Vary on the Integrated PC Server again, using either the *Vary Configuration* (VRYCFG) command, or option 8 in the Work with *Network Server Descriptions* display and then option 1 in the *Work with Configuration Status* display.

You may continue with “” on page 364 now.

Using the Same Network Server Description

Alternatively, if you have implemented interfaces or applications which rely on the original name for the NWSD (e.g., DOMINO1), you may choose to simply assign a new IP address to the existing NWSD. We expect this scenario to be relatively rare, since any such interfaces or applications would probably also require the original IP address.

However, if this situation does apply to you, follow these steps to change the external IP address for your existing NWSD:

1. On an AS/400 command line, type:

   ```
   WRKNWSD
   ```

   Press the Enter key. The Work with Network Server Descriptions display will appear.
2. Find the Network Server name that matches your Integrated PC Server. In our example, it is "`DOMINO1`". Tab down to the corresponding field under the *Opt* column and type a "2" to change the description.

Press the **Enter** key and the *Change Network Server Description* (CHGNWSD) prompt as shown in Figure 205 appears.

```
                    Change Network Server Desc (CHGNWSD)

Type choices, press Enter.

Network server description . . . > DOMINO1       Name
Resource name  . . . . . . . . . > CC07          Name
Network server type  . . . . . . > *BASE         Character value...
Online at IPL  . . . . . . . . . > *NO           *YES, *NO
Vary on wait . . . . . . . . . . > *NOWAIT       *NOWAIT, 1-15 minutes
Language version . . . . . . . . > 2924          *PRIMARY, 2963, 2966, 2980...
Country code . . . . . . . . . . > 1             *LNGVER, 001, 002, 031, 033...
Code page  . . . . . . . . . . . > 850           *LNGVER, 437, 850, 852, 857...
NetBIOS description  . . . . . . > QNTBIBM       Name, QNTBIBM
Server message queue . . . . . . > *JOBLOG       Name, *JOBLOG, *NONE
  Library  . . . . . . . . . . .                 Name, *LIBL, *CURLIB
Configuration file . . . . . . . > *NONE         Name, *NONE
  Library  . . . . . . . . . . .                 Name, *LIBL, *CURLIB
Start NetBIOS  . . . . . . . . . > *YES          *YES, *NO
Start TCP/IP . . . . . . . . . . > *YES          *NO, *YES

                                                                    More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 205. Change Network Server Description (CHGNWSD)

3. Page down. A second prompt as shown in Figure 206 appears.

```
                    Change Network Server Desc (CRTNWSD)

Type choices, press Enter.

TCP/IP port configuration:
                                 _
  Port . . . . . . . . . . . . > 1           *NONE, *INTERNAL, 1, 2, 3
  Internet address . . . . . . > '10.5.67.73     '
  Subnet mask  . . . . . . . . > '255.255.255.192'
  Maximum transmission unit  . > 1500        Number

                                 _
  Port . . . . . . . . . . . . > 2           *INTERNAL, 1, 2, 3
  Internet address . . . . . . > '10.5.67.74     '
  Subnet mask  . . . . . . . . > '255.255.255.0  '
  Maximum transmission unit  . > 1500        Number

  Port . . . . . . . . . . . . > *INTERNAL   *INTERNAL, 1, 2, 3
  Internet address . . . . . . > '192.168.7.2    '
  Subnet mask  . . . . . . . . > '255.255.255.0  '
  Maximum transmission unit  . > 15400       Number

                                                                    More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 206. Change Network Server Description (CHGNWSD) - 2. Prompt

4. If an Internet address is defined for port 1, type in a new Internet address for TCP/IP port 1. In our example, the original Port 1 address is '10.5.67.71' and

we changed it to '10.5.67.73'. The IP address must be unique within your network and conform to your subnet mask. For a larger network, you may need to consult your network administrator to obtain an appropriate new IP address for your installation.

If an Internet address is defined for port 2, type in a new Internet address for TCP/IP port 2. In our example, the original address was '10.5.67.72' and we changed it to '10.5.67.74'.

Note An Integrated PC Server configured for a Domino server always has one internal port (showing `*INTERNAL` in the *Port* parameter), and one or two external ports[7]. There is no need to change the internal IP address; depending on the future usage[8] of the Integrated PC Server, the internal port may or may not be needed. If the Domino server uses both external ports, you need to change each, as in our example. If only one port was used, it will be port 1 in most cases, but could as well be port 2.

Press the **Enter** key. A message appears on your screen indicating "Operation in progress, please wait."

5. The Work with Network Server Descriptions display will reappear. A message will appear at the bottom of your screen confirming your change. In our example, the message states, "Network Server Description DOMINO1 changed."
6. Vary on the Integrated PC Server again, using the *Vary Configuration* (VRYCFG) command.

Note In either scenario, you are changing the external IP address for the existing Integrated PC Server. If you have a large TCP/IP network with several subnetworks connected through routers or bridges, it may be necessary to flush the ARP table on the router before the router recognizes the new MAC address as owning the IP address.

Configure the Transplanted Domino for AS/400 Server

The next step is to configure the Domino for AS/400 server. Since you will be preserving the Domino server identity and not creating a new and additional server, you will configure the server as a *FIRST server even though it is technically not the first Domino server in your organization.

Using the CFGDOMSVR command, you will specify the paths to the ID files you have copied, provide information from your existing Domino environment, and specify Replace Configuration *NO. The three figures below show an example. The server name should match the existing Domino server and, if migrating from

---

[7] A reason for using two ports would be one port connects to a Token Ring, the other one to an Ethernet, or you may have 4 MB and a 16MB Token Ring.

[8] For example, if the Integrated PC Server is used to implement a firewall, the internal port needs to be used. If the Integrated PC Server is used a LAN adapter for AS/400 applications, the internal port is no longer needed.

Integrated PC Server, the NWSD name. In our example, the server name is DOMINO01.

Note If you are migrating the SMTP/MIME MTA, do **not** configure the MTA at this time. Configure a standard Domino server and then follow the instructions in "Migrating the SMTP/MIME MTA" on page 371 of this chapter.

```
                    Configure Domino Server (CFGDOMSVR)

 Type choices, press Enter.

 Server name  . . . . . . . . . . > DOMINO01
                                                                    
                                                                    
                                                                    
                                                                    
 Option . . . . . . . . . . . . . > *FIRST        *FIRST, *ADD, *REMOVE
 Data directory . . . . . . . . . > /notes/data                     
                                                                    
 Organization . . . . . . . . . . > Acme                            
                                                                    
 Administrator:
   Last name  . . . . . . . . . . > Admin                           

   First name . . . . . . . . . . > Joe
   Middle initial . . . . . . . .                 Character value
   Password . . . . . . . . . . . > ********
   Minimum password length  . . .   8       0-31
                                                                More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

Figure 207. Configure Transplanted Domino Server - Prompt 1

```
                    Configure Domino Server (CFGDOMSVR)

 Type choices, press Enter.

 Time zone  . . . . . . . . . . .   CST          GMT,EST,CST,MST,PST,CET ...
 Daylight savings time  . . . . .   *YES          *YES, *NO
 Domain name  . . . . . . . . . .   *ORG
 Network name . . . . . . . . . .   NETWORK1
 Country ID . . . . . . . . . . .   *BLANK
 Log replication events . . . . .   *YES          *YES, *NO
 Log client session events  . . .   *YES          *YES, *NO
 Replace configuration  . . . . .   *NO           *YES, *NO
 Web browsers . . . . . . . . . .   *NONE         *NONE, *HTTP
 News readers . . . . . . . . . .   *NONE         *NONE, *NNTP
 Internet mail packages . . . . .   *NONE         *NONE, *ALL, *IMAP, *LDAP...
              + for more values
 Advanced services  . . . . . . .   *NONE         *NONE, *ALL, *PARTITION...
              + for more values
 Certifier ID . . . . . . . . . .   /notes/data/cert.id
                                                                    
                                                                More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

Figure 208. Configure Transplanted Domino Server - Prompt 2

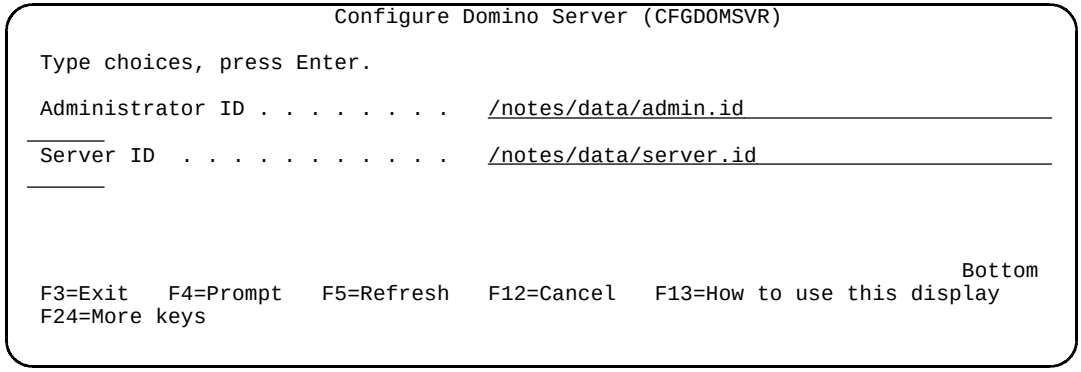
Configure Domino Server (CFGDOMSVR)
Type choices, press Enter.
Administrator ID . . . . . /notes/data/admin.id
Server ID . . . . . /notes/data/server.id
Bottom
F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display
F24=More keys

Figure 209. Configure Transplanted Domino Server - Prompt 3

For more information on configuring a Domino server see “Using the Configure Domino Server (CFGDOMSVR) Command” in Chapter 2 on page 61.

Start the TCP/IP Interface and the Domino for AS/400 Server

You have migrated your files and have configured a Domino for AS/400 server with the same identity as the original server. To start the AS/400 TCP/IP interface, use the *Configure TCP/IP* (CFGTCP) command to display a menu. Option 1 allows you to work with TCP/IP interfaces, and option 9 from the resulting display allows you to start the appropriate interface.

To start the Domino for AS/400 server, use the *Start Domino Server* (STRDOMSVR) command, the start option from the *Work With Domino Servers* (WRKDOMSVR) command, or Operations Navigator. Once you start your new Domino for AS/400 server, your users should be able to connect to it from Lotus Notes clients without making any changes on the client workstation.

Server Consolidation Process Outline

The server consolidation method offers the benefits of minimized down time during the migration and, as the name suggests, offers the potential for a smaller number of servers at the completion of the process. It involves a new server identity as well as the associated administrative challenges to manage impact to the users.

Note The name *server consolidation method* is used to denote migration to a server with a different identity from the original. A true consolidation of multiple servers will involve using either the server transplantation or server consolidation process to migrate the first of the identified servers to Domino for AS/400. Migration from the other existing servers to that same server can then be accomplished using the server consolidation process outline except for step 2, since the target Domino for AS/400 server will already exist at that point.

The planning and copying phases are identical to the server transplantation process. Beyond that, there are significant differences in the procedure and user impact. The overall process is as follows:

1. Identify the Domino databases to be migrated.
2. Configure a new Domino server on the AS/400 system with a TCP/IP address and server identity different from the existing server.
3. Use File Transfer Protocol (FTP) to copy the databases and files to be migrated from the existing server to the new.
4. Change ownership of files and directories to QNOTES and change public authorities.
5. Start the Domino server on the AS/400 system.
6. Identify any databases with local encryption which require special handling.
7. Use server-to-server replication to keep the old and the new files synchronized until complete cutover to the new server has taken place.
8. Change users' information in Public Address Book to reflect the mail server change.
9. Make appropriate changes on the users' Lotus Notes client workstations. For example, location documents must be modified to reflect a home mail server change. Database icons must be modified to reflect an application server change.

The following topics describe each of these tasks.

Identify the Domino Databases to be Migrated

This topic is identical to the topic with the same name in the server transplantation process on page 346. However, in this case you do need to transfer the Server ID file.

Configure a New, Unique Domino Server on the AS/400 System

You first need to configure TCP/IP to establish and activate a new TCP/IP interface on the AS/400 system with a unique IP address. If there is no Domino for AS/400 server configured on your AS/400 system, you can also use an existing TCP/IP interface. For details about configuring an AS/400 TCP/IP interface, please refer to "Configure TCP/IP on Your AS/400 System" on page 42.

Then you configure a Domino for AS/400 server as a new and additional Domino server in your organization. This process begins with registering the new server in the Public Address Book of your existing Domino domain. It is completed by configuring the Domino for AS/400 server using the CFGDOMSVR command with option *ADD. Details of this entire process can be found in Chapter 2 under "Configure an Additional Server in an Existing Domino Domain" on page 106.

Since configuration of an additional server does not have the issue of potentially generating a new Public Address Book or ID files, you may choose to let the configuration process create the Domino data directory for you. However, you may need to manually create any subdirectories needed to duplicate the original environment. Please refer to the topic called "Create the Domino Data Directory for the Domino for AS/400 Server" under the server transplantation process on page 349.

Copy the Domino Databases and Files to the Consolidated Server

This step is very similar to the step described under “Copy the Domino Databases and Files to the Transplanted Server” on page 352 with two exceptions:

- The Public Address Book does not need to be copied because a replica is created automatically during the configuration of an additional server.
- The ID files do not need to be copied here. The ID file for the new server will be created during the process of registering the new server. You need to be careful that this ID is not overwritten during the copy process by an existing server ID.

Technically, replication could be used for this purpose as well since the servers have different Domino and network identities. IBM Rochester used FTP for their migration because they found it much faster and more straightforward for bulk copying mail files for selected users or large numbers of users.

One tradeoff for the speed benefit of using FTP versus replication is that in order to FTP open files from the existing Domino server while it is still active, a trick may be required. In the IBM Rochester migration, a Domino console command **`dbcache flush`** followed by a **`drop all`** was used to temporarily close all databases and copy as many files as possible without having to take the Domino server down for any length of time.

With this technique, the IT support of IBM Rochester was able to accomplish their goal with minor side effects as opposed to a server outage. For example, if a user interacted with the server at the exact moment the DROP ALL command was issued, they might receive an error message, but if they immediately retried the function, it would be successful. Users not actively communicating with the server at that moment may have experienced a little bit longer connect time the next time they accessed the server.

Change Ownership and Authorities of Files and Directories

This topic is identical to the topic with the same name in the server transplantation process on page 357.

Start the Domino for AS/400 Server

To start the Domino for AS/400 server, use the *Start Domino Server* (STRDOMSVR) command, option 1 of the *Work With Domino Servers* (WRKDOMSVR) display, or Operations Navigator.

Identify and Handle Databases with Local Encryption

In most cases, if the LocalDomainServers group is identified in a database's access control list and if the new server has been added to that group in the Public Address Book, the new server should be able to access the copied databases. An exception to that rule is databases with local encryption specified on the server, for example, for some mail databases. Such databases would have been encrypted with an encryption key unique to the original server, and the new server would be denied access to them.

The FIXUP command can be used from the new Domino server console to identify any mail files in this situation. If results of FIXUP identify that the new Domino server does not have access to specific databases, you can manually create a new replica of each of those databases on the new server, using a Lotus Notes client interface. Through the replication process, Notes allows this encryption key to be rebuilt. You can then verify that all the mail data has been successfully copied and accessible by the new Domino server.

Use Replication to Keep Files Synchronized Until Cutover

The final step in data migration is to replicate the existing Domino server with the new Domino server periodically to keep the data synchronized until after cutover. After updating the Public Address Book (discussed in the next topic) to reflect the change in mail servers, one final replication of the old and new Domino servers will complete the process. From a data perspective, this process provides uninterrupted service to the user community.

Change User Information in the Public Address Book

When the location of a user's mail database is moved from one Domino server to another (one with a different Domino identity), changes need to be made to the Public Address Book, which the Domino mail router references to deliver the mail. Person documents in the Public Address Book must be modified to change the mail server and, if necessary, the mail file path for each user being migrated.

If you are migrating all users from a given server, this could be done with a simple agent. In the case of a pilot group of users migrating from different servers, a manual approach might be more straightforward.

Make Appropriate Changes on User Workstations

When the location of a user's mail database is moved from one Domino server to another (one with a different Domino identity), changes are also required on user

workstations. The user's location document, which defines how the user's mail is sent and received, must be modified to reflect the home mail server change.

When an application database moves from one server to another, icons on the users' desktops must be modified to reflect the new location. This may be done by adding a new database icon and removing the original.

These modifications can be accomplished without visiting each desktop or asking the users to perform manual tasks. In the IBM Rochester migration, the updates were handled in conjunction with end user communication by sending a series of memos. Each e-mail notification contained some information and instructions, but more importantly, contained a button with code behind it that would automatically make the appropriate client workstation changes.

For example, if the migration process took place over a calendar week, a memo could be sent on Wednesday including an announcement of the imminent migration: who, what, where, when, and why. A button in this memo could be set up to add icons for key databases on the new Domino server, such as the Public Address Book. This can also offer the benefit of load balancing by adding larger databases to user desktops well in advance of the Monday morning peak load that typically follows a migration.

On Friday morning, after updating the Public Address Book documents for each migrated user, a second memo could be sent to the affected users. This memo could include a button and some detailed instructions. The button would cause their location document in their Personal Address Book to be updated, and add an icon to their workspace for the new mail database. The instructions could explain how to manually replicate their new mail database with the old one, in case they have been manipulating their old mail file after the Public Address Book changes were made and the final replication was performed.

Over the weekend, a third and final note could be sent to our users to simply congratulate them on making the move. More importantly, by sending this final note, you can quickly identify if any users are experiencing mail routing problems.

Migrating the SMTP/MIME MTA

This section covers considerations for migrating an existing Domino *Simple Mail Transfer Protocol* / *Multi Purpose Internet Mail Extension Message Transfer Agent* (SMTP/MIME MTA, also called SMTP MTA) to Domino for AS/400. Although the guidelines explained here apply largely to migration from the Integrated PC Server, they may be helpful in the migration of the SMTP/MIME MTA from other Domino servers, particularly if they are running Release 4.5 or earlier.

Important Before attempting to migrate the SMTP/MIME MTA configuration from any other server , you should have read and understood the explanations about the AS/400 implementation of the MTA in chapter 4 “Mail Integration Through the SMTP/MIME MTA” on page 157. Especially important is the fact that the SMTP server in OS/400 is configured correctly.

The general approach is to delete configuration documents generated by the original SMTP/MIME MTA configuration process, and allow them to be reconfigured by Domino for AS/400. You begin by following the basic migration process, either the server transplantation method or server consolidation method. As described earlier in this chapter, the migration procedure essentially involves copying your Domino files from the original platform to a data directory on the AS/400 system, changing ownership, and configuring the new Domino for AS/400 server.

When you run CFGDOMSVR, you should first run it without specifying the SMTPMTA parameter, as described in the previous sections. Then, as the rest of the process outlines, you will want to delete the SMTP/MIME MTA configuration information you brought over from the original platform before letting Domino for AS/400 configure it. Otherwise, you will have duplicate configuration documents and it may be difficult to tell which one is correct.

The detailed steps in the process are as follows:

1. Start the new Domino for AS/400 server.
2. Open the Public Address Book that you have migrated from the original platform..

   To do this, double click on the database icon from your Notes client desktop or click File-Database-Open from the menu bar.
3. Delete the Global Domain Document created by the original SMTP/MIME MTA configuration process.

   The name of the global domain consists of the name of the Domino domain in which the SMTP/MIME MTA is installed followed by the character string `_SMTP`.
4. Delete the Foreign SMTP Domain Document created by the original SMTP/MIME MTA configuration process.

   The name of the foreign SMTP domain document is `*.*`.
5. Delete the SMTP-MTA connection document created by the SMTP/MIME MTA configuration process.

   This connection document specifies the Domino server name as the source server and `SMTP-MTA` as the destination server.
6. Open and edit the server document for the Domino server to make the following modifications:

- Remove *SMTP Mail Routing* from the Routing Tasks field.
- In the Internet Message Transfer Agent (SMTP MTA) section, blank out the contents of the following fields: Global Domain name, Fully Qualified Internet Host Name, MTA Work Path.

Save your changes.

7. End the Domino for AS/400 server.
8. Change the Domino for AS/400 server configuration to add support for the SMTP/MIME MTA. This involves specifying `*SMTPMTA` in the *Internet Mail Packages* parameter. This will allow Domino for AS/400 to configure the SMTP/MIME MTA by recreating the documents and fields you deleted or blanked out.

   With Domino for AS/400 4.6.2, making this change involves rerunning CFGDOMSVR with *Replace Configuration* (`*NO`) and, along with specifying the new parameter, entering again the other parameters that were specified the first time CFGDOMSVR was run. To avoid reconfiguration of anything except adding the SMTP/MIME MTA, you should specify OPTION(`*FIRST`) and specify paths to the id files regardless of how the server was initially configured.

   Beginning with Domino for AS/400 4.6.3, the *Change Domino Server* (CHGDOMSVR) command can be used for changing the configuration of a Domino server previously set up. Initially, however, it is only available in English.
9. End and restart AS/400 Mail Server Framework (ENDMSF and STRMSF).

   After setting up a Domino for AS/400 server that includes the SMTP/MIME MTA, you must reset the AnyMail function once by stopping and then restarting it.
10. Restart the Domino for AS/400 server.
11. Open in edit mode and save (even if you make no changes) the newly created global domain document, foreign domain document, and connection document. Do the same with the server document.

    At minimum, it is important to verify the information in the new configuration documents. In the server document, specifically inspect the Routing Tasks field and the information in the Internet Message Transfer Agent (SMTP MTA) section.

    Under some conditions, it is a requirement to edit and save the documents to initialize some default fields and other internal reasons, even if no changes are made. Thus, it is a good idea to perform this action and also visually verify the configuration settings.
12. Make changes to the SMTP/MIME MTA configuration documents if necessary.

In some cases, you may be required to make changes to the automatically generated configuration. One of these is if the SMTP domain name used to address mail to your users is different from the AS/400 local host and domain, and your OS/400 SMTP environment is set up to use the default SMTP mail behavior.

With Domino for AS/400, the AS/400 local host and domain, as defined in option 12 of the *Configure TCP/IP* (CFGTCP) menu, is what will be configured by default for the Internet domain suffix in the SMTP MTA global domain document.

The name used in your existing Domino environment may in fact be different. For example, the default Internet domain suffix for the Integrated PC Server SMTP/MIME MTA configuration is the TCP/IP host name and TCP/IP domain name of the NWS. The TCP/IP host name of the NWS will in fact be unique and different from the AS/400 local host name.

If you wish to continue to receive mail using the same SMTP mail addressing as before, you may need to add that name to the Internet domain suffix field along with the AS/400 host and domain. If you would like it to be used for the reply address for outgoing mail served by the SMTP/MIME MTA, it should appear first in that field. The requirement to make these changes depends on how the SMTP mail behavior is defined on your system.

For more information about configuring OS/400 SMTP mail behavior and changes which may be required to SMTP/MIME MTA configuration documents, please refer to the sections entitled "Set Up a Domino for AS/400 Server with the SMTP/MIME MTA" on page 171 and "Open and Save the MTA Configuration Documents at Least Once" on page 173 in Chapter 4 of this book.

13. End the Domino for AS/400 server and restart it.
14. Start the SMTP/MIME MTA if it is not configured to automatically start.

    The SMTP/MIME MTA can be started from the Domino for AS/400 console. You can access the console by using any of the following methods:

    - *Work with Domino Console* (WRKDOMCSL) command
    - *Work with Console* option of the *Work with Domino Servers* (WRKDOMSVR) command
    - Operations Navigator
    - Lotus Notes client administration interface
    - Web browser administration interface

    To manually start the SMTP/MIME MTA, type the following command on a Domino console command line:

    ```
    LOAD SMTPMTA
    ```

Once the SMTP/MIME MTA has been successfully tested, you may choose to enable it to automatically start whenever the Domino server starts. This can be done either by editing NOTES.INI and adding SMTPMTA in the '`ServerTasks=`' line, or by issuing a SET CONFIG command from the Domino console. For more details about the SET CONFIG command, refer to the manual "Installing and Managing Domino for AS/400" under the topic "Starting the SMTP/MIME MTA" and the section titled "Automatically as an add-in server task".

Using Domino on the Integrated PC Server After Migrating

After you migrated the SMTP/MIME MTA from the Integrated PC Server, you may still continue to use the Domino server on the Integrated PC Server. This would be true, for example, if you migrated only selected applications including the MTA to Domino for AS/400. If this the case, you also need to make sure the MTA will no longer be started on the Integrated PC Server.

To do so, rename the file `ISMTPMTA.EXE` in the `k:\notes` directory for Domino on the Integrated PC Server. Renaming this file will disable the SMTP/MIME MTA for Domino on the Integrated PC Server, so that the *Start Network Server* (STRNWSAPP) command will no longer load it.

Additional Considerations When Migrating from Integrated PC Server

There are some unique and additional considerations when migrating from the Domino implementation on an Integrated PC Server (OS/400 Integration of Lotus Notes). One reason is that special installation procedures are required for this Domino implementation due to the fact that an Integrated PC Server does not have a direct workstation interface to its operating system. The other is that the Integrated PC Server implementation of Domino offers some unique integration features that have been implemented differently with Domino for AS/400.

The primary considerations are related to the following:

- *Add Notes User* (ADDNTSUSR) command
- Differences in default port names
- Dial-up connectivity (X.PC versus PPP/SLIP)
- Directory shadowing vs. directory synchronization
- Database integration (DataProp versus NotesPump)
- Backup and recovery (ADSM vs. BRMS or OS/400 IFS backup/recovery tools)
- Capability to submit Domino commands from a CL program

The following topics describe each of the issues and offer suggestions for ways to address them.

Add Notes User Command

Add Notes User (ADDNTSUSR) is a command unique to the Integrated PC Server implementation of Domino. It provides a method of registering Lotus Notes users from an AS/400 interface, interactive or batch.

Domino for AS/400 offers the Operations Navigator interface for both Domino and AS/400 administration. Notes user registration is available directly from a Notes client, a Web browser, or an Operations Navigator front end to the administration functions of a Notes client. The ADDNTSUSR command or an equivalent has not been implemented with Domino for AS/400.

With the Integrated PC Server implementation, before you can add Notes users with the ADDNTSUSR command, AS/400 System Distribution Directory entries must exist for users to be registered. Those entries are automatically modified specifically for the Integrated PC Server implementation of Domino. This is particularly important if the SMTP/MIME MTA is in use on the Integrated PC Server. When mail integration is installed on the Integrated PC Server, the behavior of the ADDNTSUSR command is changed to add specific user-defined fields to the System Distribution Directory entries.

If you have Notes users who were registered using the ADDNTSUSR command and you now wish to migrate them to Domino for AS/400, some AS/400 System Distribution Directory entry changes need to be made in order for those users to successfully receive SMTP mail. These changes can be made interactively using the *Work With Directory Entries* (WRKDIRE) command.

Alternatively, they can be made in batch from a CL program using the *Change Directory Entries* (CHGDIRE) command. Your CL program would need to read through the System Distribution Directory to identify which user entries must be modified, and then use CHGDIRE to modify each appropriate entry.

The required changes are:

- Change the Mail Service Level from **`9=other`** to **`4=Lotus Domino`**.
- Edit the user-defined fields to blank out the contents of all the fields for which the first part of the name begins with QYN and the second part of the name is QNOTES.

If you want to change a directory entry interactively from an AS/400 interface, enter the *Work With Directory Entries* (WRKDIRE) command on any AS/400 command line, type option 2 next to the entry to be changed and press Enter**.** You will see the *Change Directory Entry* display as shown in Figure 210.

```
                          Change Directory Entry

User ID/Address . . . . :   WBLANKER  NTSIPCS

Type changes, press Enter.

  Description . . . . . .   Wilfried Blankertz on IPCS Notes
  System name/Group . . .   NTSIPCS   _________     F4 for list
  User profile  . . . . .   __________              F4 for list
  Network user ID . . . .   WBLANKER NTSIPCS

  Name:
    Last  . . . . . . . .   Blankertz
    First . . . . . . . .   Wilfried
    Middle  . . . . . . .   _____________________
    Preferred . . . . . .   _____________________
    Full  . . . . . . . .   Blankertz, Wilfried



                                                                      More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F18=Display location details
F19=Change name for SMTP   F20=Specify user-defined fields   F24=More keys
```

Figure 210. Change Directory Entry

Press the PageDown (**PgDn**) key **four times** and you will see the panel shown in Figure 211.

```
                          Change Directory Entry

User ID/Address . . . . :   WBLANKER  NTSIPCS

Type changes, press Enter.

  Mail service level  . .   9                     1=User index
                                                  2=System message store
                                                  4=Lotus Domino
                                                  9=Other mail service
    For choice 9=Other mail service:
      Field name  . . . .   QYNMMAILTY  QNOTES__  F4 for list

  Preferred address . . .   3                     1=User ID/Address
                                                  2=O/R name
                                                  3=SMTP name
                                                  9=Other preferred address
    Address type  . . . .   ________              F4 for list
    For choice 9=Other preferred address:
      Field name  . . . .   __________  ________  F4 for list
                                                                      More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F18=Display location details
F19=Change name for SMTP   F20=Specify user-defined fields   F24=More keys
```

Figure 211. Change Mail Service Level

You need to change the field *Mail service level* to 4 and then press **F20** (usually **shift** and **F8**) to see the “user defined fields”. You need to erase the contents of all

fields having a name starting with QYN and having a second qualifier of QNOTES. Page forward to find those fields. An example is shown in Figure 212.

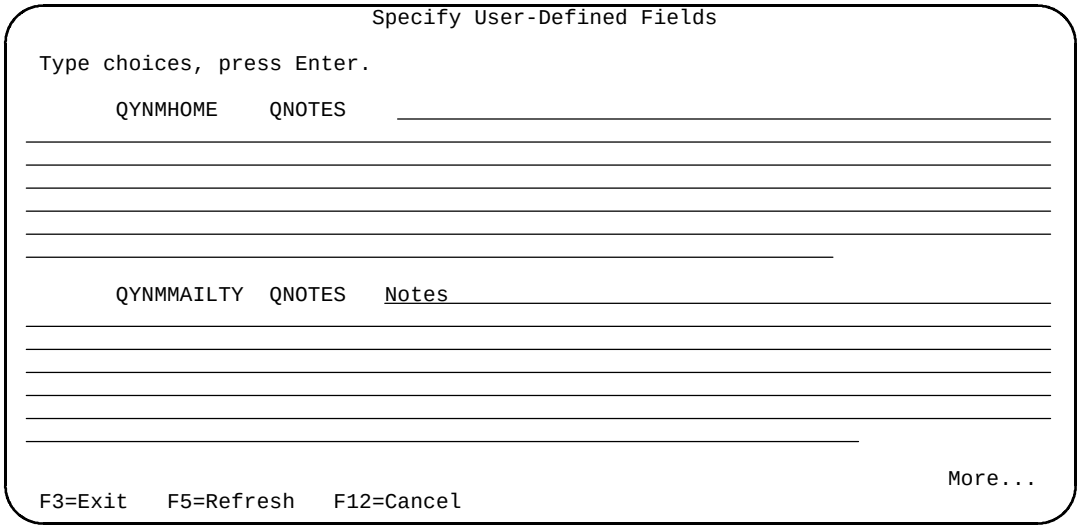

Figure 212. Specify User-Defined Fields

If you want to write a CL program to change multiple directory entries, you can use the *Change Directory Entry (CHGDIRE) command as shown here:*

```
CHGDIRE USRID(&USERID &ADDRESS)                    +
          USRDFNFLD((QYNMSHORT QNOTES *NONE)       +
                (QYNMNTSDMN QNOTES *NONE)          +
                (QYNMHOME QNOTES *NONE)            +
                (QYNMSVR QNOTES *NONE)             +
                (QYNMMAILTY QNOTES *NONE)          +
                (QYNMFADDR QNOTES *NONE)           +
                (QYNMORGU QNOTES *NONE))           +
          MSFSRVLVL(*DOMINO)
```

Note There may be also generic *ANY entries in your system distribution directory directing all mail with a certain SNADS address or SMTP domain to the SMTP/MIME MTA on the Integrated PC Server. If this is the case, those need to be removed or changed in the same manner as the individual entries, as described above.

Differences in Default Port Names

Default Domino port names are not the same between the Integrated PC Server implementation of Domino and Domino for AS/400. For example, the default Domino port for the TCP/IP protocol is called `FSNOTES_TCPIP` on the Integrated PC Server, and `TCPIP` in Domino for AS/400 and other platforms.

If you use the server transplantation method of migration, manual configuration changes to any existing connection documents in the Public Address Book will most likely be required. As a result of the migration process described in this chapter, the port `FSNOTES_TCPIP` will be enabled in the server document and possibly referenced in connection documents, because the NAMES.NSF was copied from the Integrated PC Server. However, the NOTES.INI file of the Domino for AS/400 server will only define the port `TCPIP`. This may result in a conflict. There are three potential alternatives to resolve this situation, listed below:

- Disable the Domino port called `FSNOTES_TCPIP` and modify your connection documents to use the port `TCPIP` instead.
- Assign unique network addresses to the two Domino ports. You could either use unique IP addresses or a port mapping scenario in which the server acts as its own port mapper. The technique would be comparable to the one used in setting up partitioned servers, described in Chapter 2 of this book.
- Disable the Domino port called `TCPIP`.

Important This third option is not recommended. The port named `TCPIP` may have other implications since it is the default name used by Domino for AS/400.

Dial-up Connectivity

There are varied protocols for dial-up connectivity to Domino on different platforms. Virtually all of the platforms support TCP/IP. On some Domino platforms, a proprietary protocol called X.PC is also supported for dial-up connectivity from client workstations.

The Integrated PC Server implementation of Domino supports X.PC on its own modem port (exclusive to the Pentium version) and it can also take advantage of the TCP/IP dial support (PPP and SLIP) provided with OS/400.

Domino for AS/400 supports the TCP/IP protocol exclusively and uses the AS/400 system's native communications hardware and software. Dial-up connectivity to Domino for AS/400 is available using PPP or SLIP.

Thus, if you are using X.PC with the communications hardware of the Integrated PC Server, migration of your dial-up connectivity environment to TCP/IP dial will be a consideration. For details on Domino for AS/400 dial-up connectivity alternatives and configuration, please refer to Chapter 7 of this book.

Directory Shadowing versus Directory Synchronization

The Integrated PC Server implementation of Domino supports one-way directory shadowing from the AS/400 System Distribution Directory to the Domino Address Book. Domino for AS/400 provides flexible and comprehensive bi-directional directory synchronization that is available even if the Domino server itself is not running. You will want to take advantage of the additional power and integration available with this feature. For more details on Domino for AS/400 directory synchronization and its configuration, please refer to Chapter 5 of this book.

One consideration is that if you have Lotus Notes users registered using the *Add Notes User* (ADDNTSUSR) command, the same modifications required for mail integration apply when directory synchronization is used. Refer to "Add Notes User (ADDNTSUSR) Command" on page 377.

Database Integration

With Domino on the Integrated PC Server, integration with DB2 for AS/400 data is accomplished using the companion product DataPropagator/400, which needs to be purchased separately. *DB2 for AS/400 Integration for the Integrated PC Server* allows data which resides on the AS/400 to be imported or shadowed to Lotus Domino databases. User authorities to the DB2/400 tables can also be shadowed to the Domino database and translated into ACL settings. Updates of shadowed data can be applied to DB2 for AS/400 tables only through a user written AS/400 exit program.

Domino for AS/400 significantly enhances the flexibility of real time bi-directional data access. Here are some examples of Domino for AS/400 data integration:

- Domino for AS/400 server-based agents using @DB commands or LotusScript: Data Object (LS:DO) have direct access to DB2 for AS/400 data without ODBC drivers.
- Lotus Notes client users can dynamically run a DB2 for AS/400 query and import the results into a Domino document.
- Application programming interfaces provide access to Domino data and services from AS/400 application programs.
- Bidirectional batch transfer of data between Domino and DB2 for AS/400 is available without programming, using the companion product NotesPump, which is purchased separately. NotesPump can be used in many cases to provide the shadowing capability of DataPropagator/400 and eliminate the need for user exit programs.
- NotesPump real time support provides the capability to define form-based field mapping between Domino and DB2 for AS/400 for interactive, real time data access without the need for programming. With Domino for AS/400 4.6.3, there is a function similar to NotesPump real time support integrated with the core server under the name *Domino Enterprise Connection Services* (DECS).

Thus, much function and flexibility is available with Domino for AS/400. If you are using database integration today with Domino on an Integrated PC Server, one or more of these integration tools must be incorporated into your migration plans. You need to be aware that DataPropagator/400 is not used with Domino for AS/400 for database integration, and that for bulk data shadowing, the supplemental product NotesPump may be appropriate for your environment.

Backup and Recovery

The Integrated PC Server implementation of Domino offers granular backup and recovery utilizing the optional product Adstar Distributed Storage Manager (ADSM).

With Domino for AS/400, Domino databases and files are stored as separate stream file objects in the Integrated File System (IFS), whereas the NWS storage space is a single object representing the entire (virtual) disk attached to the Integrated PC Server.

A key advantage of the IFS implementation of Domino for AS/400 is the ability to integrate Domino backup into your usual AS/400 backup procedures. These could incorporate the appropriate *Save Object* (SAV) and *Restore Object* (RST) commands into your strategies for full or incremental backup and recovery. For more details about Domino for AS/400 backup and recovery, please refer to Chapter 3 on page 135 of this book.

Note For installations that have large amounts of data or require unattended backup, the Backup and Recovery Management Services (BRMS) software and a tape library system provide a good solution.

Some considerations to think about in moving from the ADSM backup/recovery method to native AS/400 IFS backup/recovery tools include approaches for backup of "active" files and recovery at the document level.

Some Domino databases, for example the Domino Directory (formerly called Public Address Book or Name and Address Book), are always open whenever the Domino server is running. High availability requires minimal Domino server down time for routine maintenance such as backup.

If you require 24x7 availability, you may choose to replicate to a partition which can be taken off line for backup, while your primary Domino server remains available. This is the approach used in production by the internal IS department at IBM Rochester. See “Implementing Backup and Recovery Strategies” on page 420 for more information. Another alternative is to use the Domino clustering capability available with the advanced services of the Domino Enterprise Server license.

Domino for AS/400 security has implications in a backup/recovery strategy. The Domino for AS/400 security implementation takes advantage of a combination of AS/400 security and Domino security. AS/400 security protects Domino databases

from access outside of the control of Domino by setting public authority for all Domino objects to *EXCLUDE.

Document Level Restore

One advantage of the ADSM implementation on the Integrated PC Server is the possibility to restore single documents, for example if one or more documents were accidentally deleted by a user. The backup and recovery function for Domino for AS/400 does not provide such a possibility. However, you may restore the complete Domino database to a different IFS directory and then copy the required documents using a Notes workstation.

Application programming interfaces as well as more complete backup/restore solutions to allow more flexible and granular backup and recovery are planned for a future release of Domino for AS/400.

Capability to Submit Domino Commands from a CL Program

One benefit of the *Submit Network Server Command* (SBMNWSCMD) command for the Integrated PC Server is the capability to submit commands to the Domino console using a batch interface. If you are using this feature to provide access to Domino commands from a CL program, please note that this capability is not available with Domino for AS/400 4.6.2 or earlier versions. Domino for AS/400, however, provides programmatic access to Domino resources from AS/400 application programs using application programming interfaces (APIs).

General Considerations When Migrating Your Domino Infrastructure

The primary focus of this chapter has been migration from one Domino server platform to another -- specifically migration to the Domino for AS/400 platform. Special considerations are involved when migrating from one major release of Lotus Notes and Domino to another. Migration for any mission-critical system requires careful planning; therefore many of the steps required are also typical steps for migrating any mission-critical system to a major new release. When migrating from one release to another, the recommended order for migration is: first the servers, then the clients, and then the applications. Please refer to Lotus product documentation for detailed release migration information.

Many migration scenarios also involve coexistence between the old and the new environments for some period of time. However, this dictates the consolidation method, as described in “Server Consolidation Process Outline” on page 367, rather than the transplantation method as described in “Server Transplantation Process Outline” on page 345.

Whether or not actual coexistence is involved, comprehensive testing using a test environment prior to production migration is highly recommended. In any migration process, careful, detailed planning and the well-managed execution of that plan is critical to the success of the migration.

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Appendix A
Using Facsimile Support for AS/400

This appendix provides information about how to use Facsimile Support for AS/400 in combination with Lotus Domino for AS/400. It also explains the two different ways in which you can fax data from a Lotus Notes client and shows you how to route received faxes to Lotus Notes mail.

Setting Up Facsimile Support

To use Facsimile Support for AS/400 with Lotus Domino, complete the following steps:

1. Install Lotus Domino on the AS/400 system.
2. Configure Lotus Domino on the AS/400 system.
3. Install and configure Lotus Notes on the PC workstation.
4. Start Lotus Domino on the AS/400 system.
5. Start the QMSF subsystem on the AS/400 system. For this step to work, you may need to end the QMSF subsystem and then restart it.

Steps for Installing and Configuring Facsimile Support for AS/400

Before using the Facsimile Support for AS/400 product, you need to install, configure, and customize the product to meet the needs of your business. The following steps explain how to install and prepare the Facsimile Support for AS/400 product.

1. Use the *Restore Licensed Program* (RSTLICPGM) command to install the Facsimile Support for AS/400 licensed product (5798-TBY) on your AS/400 system.

   For information on installing this product, see Chapter 2, “Managing the Facsimile Support for AS/400 Product on the AS/400 System” in the *Facsimile Support for AS/400 Installation Guide*, SC41-0654-00. If you have an AS/400 9401 Model 150, the Facsimile Support for AS/400 product is pre-installed.

2. Define each fax controller to the AS/400 system. To do so, complete the following steps:

   - Use the *Create Fax Description* (CRTFAXD) command to create a description that identifies the fax controller on the AS/400 system. You

must specify the LINKTYPE parameter *LAN, *TDLC, *FAX, or *ASYNC.

- For details on the CRTFAXD command, see the *Facsimile Support for AS/400 Programmer's Guide and Reference*, SC41-0656-00.
- Use the *Add Fax Card* (ADDFAXCRD) command to separately declare each telephone line that is attached to the fax controller. Depending on whether you have an external fax controller or an internal fax controller, you need to provide information relating to that specific controller.
- For *external fax controllers*:

  Provide information that defines each fax controller and fax card that is located in the controller. (See Chapter 3, "Installing and Configuring the Facsimile Support for AS/400 Product on the External Fax Controller" in the *Facsimile Support for AS/400 Installation Guide*, SC41-0654-00, for instructions.)
- For *internal fax controllers*:

  Provide information that defines the controller and ports that are associated with the controller. This includes the 7852-400 modem. (See "Configuring the Facsimile Support for AS/400 Product" in the *Facsimile Support for AS/400 Installation Guide*, SC41-0654-00.)

3. Install the necessary hardware and software. Refer to the publications listed below for installation options:

- To use the 7852-400 modem, see "Installing the 7852-400 Modem" on page 3 through 28 of the *Facsimile Support for AS/400 Installation Guide*, SC41-0654-00.
- To use an external fax controller, see Chapter 3, "Installing and Configuring the Facsimile Support for AS/400 Product on External Fax Controller" in the *Facsimile Support AS/400 Installation Guide*, SC41-0654-00.

4. Use the *Create Fax Profile* (CRTFAXPRF) command to create the necessary fax profiles for AS/400 users who use the Facsimile Support for AS/400 product.

For more details on the CRTFAXPRF command, see the *Facsimile Support for AS/400 Programmer's Guide and Reference*, SC41-0656-00.

5. Use the *Configure Fax Services* (CFGFAXSRV) command to configure the enhanced services portion of the Facsimile Support for AS/400 product.

Enhanced services allows you to customize your fax operating environment. See the *Facsimile Support for AS/400 User's Guide*, SC41-0655-00, for more information about Enhanced Services. To use the CFGFAXSRV command, the user must be set up as a Fax Administrator.

6. Use the *Start Fax Support* (STRFAXSPT) command to start the Facsimile Support for AS/400 product.
7. Use the *Create Fax Master List Entry* (CRTFAXMLE) command to add entries to the fax master list. Include all of the destinations to and from which you plan to send and receive faxes.

   For more information, see the *Facsimile Support for AS/400 Programmer's Guide and Reference*, SC41-0656-00.
8. Use the *Create Fax Distribution List* (CRTFAXDST) command to create fax distribution lists. Fax distribution lists contain entries from the Fax Master List and allow you to send faxes to specific groups of users.

   For more information, see the *Facsimile Support for AS/400 Programmer's Guide and Reference*, SC41-0656-00.
9. Set up your AS/400 for integrating the Facsimile Support for AS/400 product with the AnyMail/400 Mail Server Framework product. For more information, see the *AnyMail/400 Mail Server Framework Development Guide*, SG24-4449. The section Setting Up Your System Distribution Directory Entry gives an example of how to set up System Directory entries for faxing.

Using the AnyMail/400 Mail Server Framework

Before using the AnyMail/400 Mail Server Framework product, you need to add fields to the system directory attributes that are used by the AnyMail/400 Mail Server Framework product. Facsimile Support for AS/400 requires these user-defined fields. Use the *Change Fax System Directory Attributes* (CHGFAXSDA) command to add these fields. For details on this command, see the *Facsimile Support for AS/400 Programmer's Guide and Reference*, SC41-0656-00.

Setting Up Your System Distribution Directory Entry

The system distribution directory is similar to an address book. Electronic mail support uses the system distribution directory on the AS/400 system. If you use the system distribution directory, add a directory entry for each fax recipient for whom you want to use this function. The system distribution directory entries associate the mail addresses with the fax-telephone numbers, master-list entries, or distribution lists. The contents of the user-defined fields in the directory entry should match the fax master list or fax distribution list entries that you have already created using the Facsimile Support for AS/400 Enhanced Services. Give each entry a unique user ID and address. For example, you can assign a user ID with an address of FAX to represent the person or company who uses the fax.

The displays in this section provide examples of how to add a system distribution directory entry for a fax machine in the Accounts Receivable department for ABC Office Furniture Company. The user who receives the faxes is Scott Jones, who

works in the Accounts Receivable department. In this example, we use the information in the Fax Master List, so we do not specify a fax telephone number.

The Fax Master List Entry in our example is as follows:

Destination	Identifier	Entry
ABC Office Furniture Co.	**9876**	**Accounts Receivable**

To add an entry, use the Work With Directory Entries (WRKDIRE) command. When you press the **Enter** key, a display similar to the one in Figure 213 appears.

```
                          Work with Directory Entries
Type options, press Enter.
   1=Add      2=Change   4=Remove   5=Display details   6=Print details
   7=Rename   8=Assign different ID to description   9=Add another description

 Opt  User ID   Address   Description
  _   ________  ________
  _   AAA       FAX       fafadfa
  _   ACCOUNTS  FAX       ACME Accounts Receivable
  _   DSCHROED  SYSASD2V  Dennis Schroeder
  _   FAXDLE    FAX       Bad dist list
  _   FAXGCS    FAX       Fax to Grand Central
  _   FAXMLE    FAX       Grand Central 57574
  _   FAXMLE2   FAX       Team Office 57574
  _   FAXTELN   FAX       Phone number 57574
  _   HOCKEY    FAX       Test DST\\Entry
  _   IZZY      SYSASD2V  D49M, Izzy POP3 ID
  _   KLUCK     SYSASD2V  kluck directory entry
  _   KPS       SYSASD2V  Kevin Stamschror
                                                                        More...
 F3=Exit      F5=Refresh   F9=Work with nicknames   F11=Sort by description
 F12=Cancel   F13=Work with departments   F17=Position to   F24=More keys
```

Figure 213. Work with Directory Entries

Select option 1 (Add) on the Work With Directory Entries display and press the **Enter** key. The Add Directory Entry display appears as shown in Figure 214.

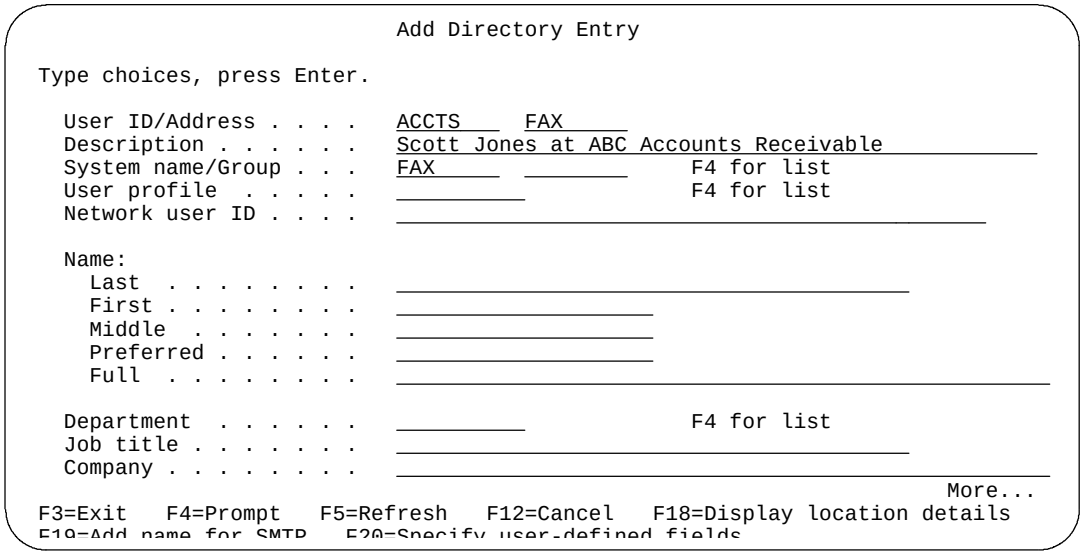
Add Directory Entry
Type choices, press Enter.
User ID/Address . . . . ACCTS FAX
Description . . . . . Scott Jones at ABC Accounts Receivable
System name/Group . . . FAX F4 for list
User profile . . . . . F4 for list
Network user ID . . . .
Name:
Last . . . . . .
First . . . . . .
Middle . . . . . .
Preferred . . . . . .
Full . . . . . .
Department . . . . . F4 for list
Job title . . . . . .
Company . . . . . .
More...
F3=Exit F4=Prompt F5=Refresh F12=Cancel F18=Display location details

Figure 214. Add Directory Entry

Complete the fields on the Add Directory Entry display as they are described in the remainder of this section. All of the fields for the Add Directory Entry displays are shown. Specify only the required fields, as they are described in this section. Depending on your own needs, you may also choose to enter the optional information.

User ID and Address:
Enter the user ID and address for this entry. In our example, the user ID is ACCTS at address FAX. A fax machine resides at this address, for use by the Accounts Receivable department at ABC Office Furniture Company.

Description:
Enter a description of the user for whom you are adding this entry. In our example, this is Scott Jones at ABC Accounts Receivable.

System Name and Group:
For a fax entry, enter FAX as the system name. Do not enter the actual system name. Do not use the *Group* field. Press the **Enter** key, and the following message appears:

`System name and group not found. Press enter to confirm.`

This is not an error; ignore this message and press the **Page Down** key to continue.

Fax Telephone Number:
Enter the fax telephone number for the fax recipient. If you are using a fax distribution list or a fax master list entry, you do not need to enter the Fax *telephone number* field. Instead, complete the information in the user-defined fields. In the example shown in Figure 215, we use a fax master list entry, so leave the *fax telephone number* field blank.

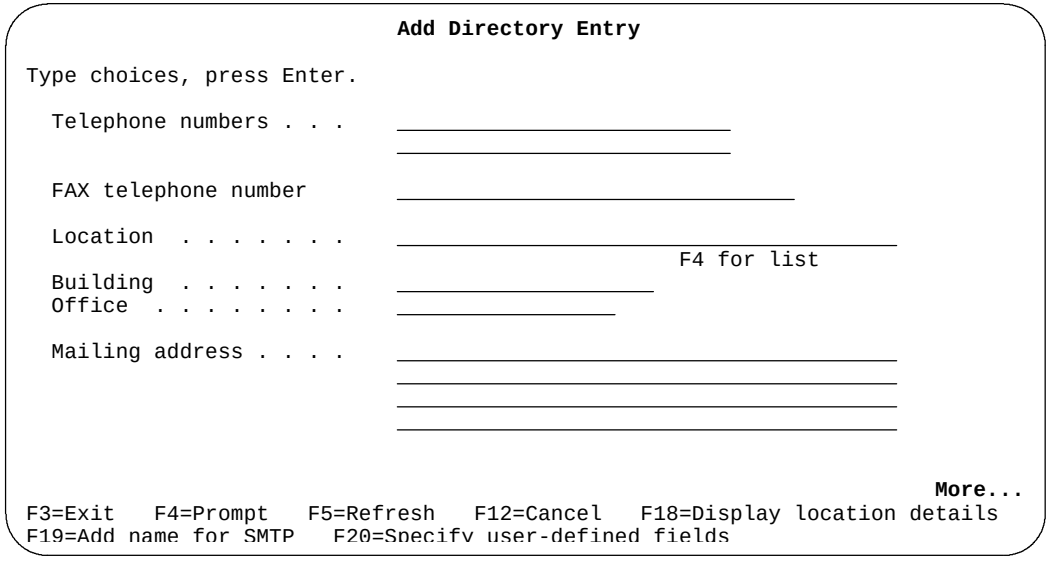
Add Directory Entry
Type choices, press Enter.
Telephone numbers . . .
FAX telephone number
Location . . . . . .
F4 for list
Building . . . . . .
Office . . . . . .
Mailing address . . . .
More...
F3=Exit F4=Prompt F5=Refresh F12=Cancel F18=Display location details
F19=Add name for SMTP F20=Specify user-defined fields

Figure 215. Add Directory Entry Second Display

To view the parameters in the third display, as shown in Figure 216, use the **Page Down** key.

```
  Add Directory Entry

Type choices, press Enter.

  Indirect user . . . . .   N                     Y=Yes, N=No
    For choice Y=Yes:
      Print private mail    N                     Y=Yes, N=No

  Print cover page  . . .   Y                     Y=Yes, N=No
  Mail notification . . .   1                     1=Specific types of mail
                                                  2=All mail
                                                  3=No mail
    For choice 1=Specific types of mail:
      Priority, private,
        important mail      Y                     Y=Yes, N=No
      Messages  . . . . .   Y                     Y=Yes, N=No

  Text  . . . . . .         ____________________________________________________


                                                                        More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F18=Display location details
F19=Add name for SMTP   F20=Specify user-defined fields
```

Figure 216. Add Directory Entry Third Display

To view the parameters in the fourth display, as shown in Figure 217, use the **Page Down** key.

```
Type choices, press Enter.

  Mail service level  . .   9                     1=User index
                                                  2=System message store
                                                  4=Lotus Domino
                                                  9=Other mail service
    For choice 9=Other mail service:
      Field name  . . . .   __________  ________  F4 for list

  Preferred address . . .   9                     1=User ID/Address
                                                  2=O/R name
                                                  3=SMTP name
                                                  9=Other preferred address
    Address type  . . . .   FAXDESTA              F4 for list
    For choice 9=Other preferred address:
      Field name  . . . .   QFAXDEST   QFAX ___   F4 for list


                                                                        More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F18=Display location details
F19=Add name for SMTP   F20=Specify user-defined fields
```

Figure 217. Add Directory Entry Fourth Display

Mail Service Level:
Select option 9 (other mail service). Specify the field name for the mail service level QFAXSRVLVL QFAX.

Preferred Address:
This is the address that represents the system distribution directory entry. Select option 9 (other preferred name) and enter the field name. The field name that you specify must be consistent with the information that you specify in the user-defined fields. The address type must be one of the following:

- FAXTELNB for a fax telephone number
- FAXDESTA for a fax master list entry
- FAXDISTA for a fax distribution list

Field name consists of two values: a field name and a product ID. Complete the field name as follows:

- For a fax telephone number, type:
  `FAXTELNBR *IBM`
- For a fax master list entry, type:
  `QFAXDEST QFAX`
- For a fax distribution list, type:
  `QFAXDIST QFAX`

The field name matches the address type that you specified. A corresponding product ID is also required. The following table shows the relationship between these values:

Preferred Address	*Field Name*	*Product ID*
FAXTELNB	FAXTELNBR	*IBM
FAXDEST	QFAXDEST	QFAX
FAXDIST	QFAXDIST	QFAX

In our example, we specify FAXDESTA because we are using a fax master list entry.

You must specify these fields if you are using a fax master list entry or a fax distribution list. To enter the user-defined fields, press the **F20** key. You can use

F24 (More keys) to view more function keys. The Specify User-Designed Fields display appears, as shown in Figure 218.

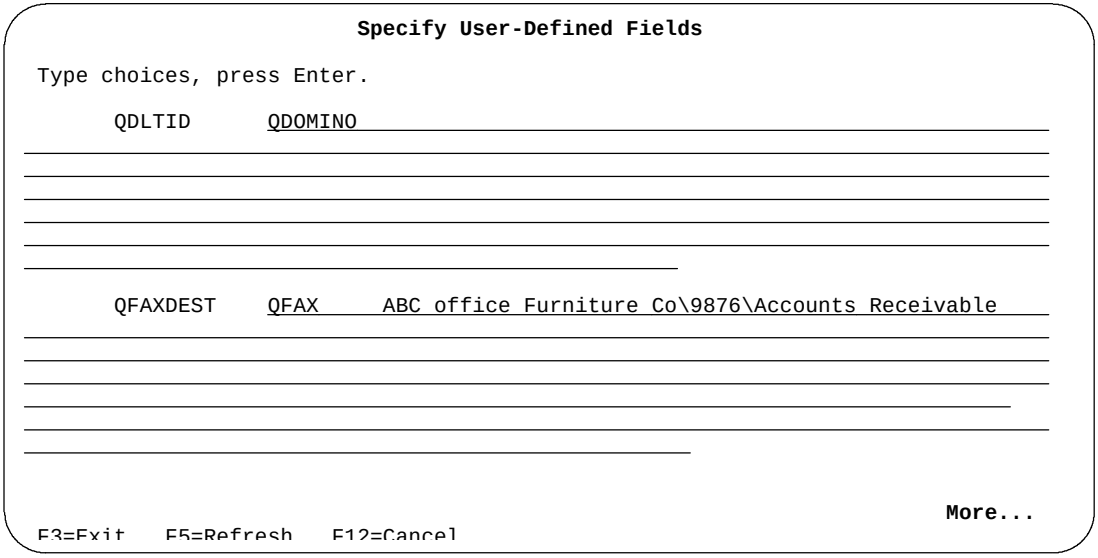

Figure 218. User-Defined Fields

The Specify User-Defined Fields display allows users to access entries in the fax master list and fax distribution lists that you have already set up through the Facsimile Support for AS/400 product. This simplifies the task of finding the recipient when more than one person uses the fax machine. It allows you to tie the entry to a Facsimile Support for AS/400 master list entry to allow for a customized cover page.

The information for the *User-defined fields* must be consistent with the field name and ID that you previously entered for the *Preferred address field*. If you enter a fax telephone number (FAXTELNB) for the preferred address, Facsimile Support for AS/400 does not use the user-defined fields.

Field Name:
The value that you enter for the *Field name* depends on the information that you specified for the *Preferred address* field. The following values are valid for the *Field name*:

To use a fax distribution list, enter: QFAXDIST. You must also specify the preferred address of: FAXDISTA.

To use a fax master list entry, enter: QFAXDEST. You must also specify a preferred address of: FAXDESTA.

Product ID:
Enter QFAX.

Value:
Use this field to specify the fax distribution list or the fax master list entry. Enter the value as it appears on the fax distribution list or the fax master list, in the following format:

`destination\identifier\entry`

For our example, we enter:

`ABC Office Furniture Co\9876\Accounts Receivable`

You must specify the *Destination*, *Identifier*, and *Entry*. If you omit one of these values, you must specify the corresponding delimiter (\). For example, to omit the *Identifier*, specify the entry as follows:

`ABC Office Furniture Co\\Accounts Receivable`

To omit the *Identifier* and *Entry* for a simple destination, specify the entry as follows:

`ABC Office Furniture Co\\`

Defining an Address for Simple Mail Transfer Protocol

Press the **F19** key to add the name for SMTP. In our example, we are creating an ACCTS FAX entry. Depending on whether or not you converted the format of the SMTP names in your system distribution directory (SDD), one of two different looking panels will appear:

If you did *not* convert the SDD on your AS/400 system, the Add Name for SMTP display appears as shown in Figure 219.

```
                          Add Name for SMTP

Type choices, press Enter.

  User ID . . . . . :   ACCTS
  Address . . . . . :   FAX



  SMTP user ID  . . . . . .   accts
  SMTP domain . . . . . .   test.name.ibm.com
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________

  SMTP route  . . . . . .   _____________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________


F3=Exit   F4=Prompt   F12=Cancel
```

Figure 219. Add Name for SMTP (If SDD Was Not Converted)

If you converted the SDD on your AS/400 system using the *Convert SMTP Names* (CVTNAMSMTP) command, the *Specify User-Defined Fields* prompt appears as shown in Figure 220.

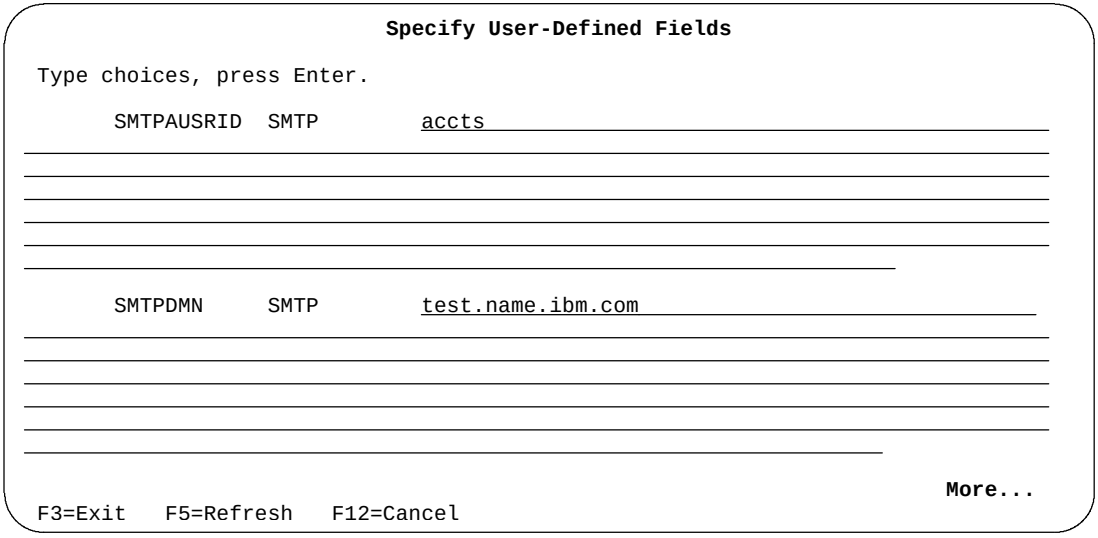

Figure 220. Add Name for SMTP (if SDD was Converted)

Note While the SMTP user ID (`accts` in our example) can be an arbitrary, yet unique name, the SMTP domain (`test.name.ibm.com`) is *not* a random name. It must resolve (via DNS or local hosts table) to an IP address of one of the interfaces on your AS/400, most likely the AS/400 system's fully qualified TCP/IP host name.

For more information about SMTP and the CVTNAMSMTP command, see the *TCP/IP Configuration and Reference* book, SC41-5420, or the redbook *AS/400 Electronic-Mail Capabilities*, SG24-4703. Additional information is available via the AS/400 Online Library at:

`http://as400bks.rochester.ibm.com`

Faxing From Lotus Notes

Now that you have created your directory entry, you can mail from Lotus Notes to that system directory entry. To mail, type information in the *To* field as shown in this example:

`accts@test.name.ibm.com`

When the mail item gets to the AS/400 system, the AnyMail snap-ins determine that the directory entry has an address type of FAX. The mail item is faxed to the

fax telephone number, the fax master list entry, or the fax distribution list that is specified in the system directory entry.

Faxing From Client Access/400

Another option that you can use to fax from your Lotus Notes workstation is to install the Client Access/400 AFP Print driver and configure a printer as an IBM AFP Facsimile Support for AS/400 device. When printing from Lotus Notes, a dialog prompts you for fax destination information. The following information describes how this option works.

Prerequisites

Complete the following steps before you configure the PC workstation to fax PC output.

1. Install Windows NT or the Windows 95 Operating System on the PC workstation.
2. Install Client Access/400 on the PC workstation and select the AFP Printer driver to be installed.
3. Install the latest Service Pack for Client Access/400.
4. Establish a session with the AS/400 system on the PC workstation.

Configuring the PC Workstation to Fax PC Output

To configure the PC Workstation to fax PC output, complete the following steps:

1. From the Windows desktop, choose **Start - Settings - Printers**.
2. From the Printers window, double-click **Add Printer**.
3. The **Add Printer Wizard** appears. To begin installing your printer, click Next.
4. Choose **Network Printe**r and click Next.
5. From the Add Printer Wizard window, click **Browse**.
6. In the **Browse for Printer** window, double-click the AS/400 system that you want to print to.
7. A list of printers appears. Double-click **QFQFS4PRTD**.
8. If a message appears, click OK. If no message appears, go to the next step.
9. In the Printer window, a name appears in the format: \\xxxx\qfqfs4prtd (xxxx is equal to the system name to which you are connecting).

10. The Add Printer Wizard window appears. Under the Manufacturers heading, select IBM. Under the Printers heading, select IBM AFP Facsimile Support/400 and click **Next**.

11. On the Add Printer Wizard window, click **Next**.

    Return to the Printers window and verify that the IBM AFP Facsimile Support/400 printer is added. Be patient, as this may take some time. You can close this window. Now you can fax Lotus Notes output.

Routing Received Faxes to Domino for AS/400

You can use Enhanced Services routing to route faxes that are received through Facsimile Support for AS/400 to Domino for AS/400. If you have the necessary hardware, you can use the Transmitting Subscriber Identifier (TSI) or routing tones received from the Dual Tone Multi-Frequency (DTMF) or Direct Inboard Dial (DID) fax modems to route information. The information that follows explains how to set up this kind of routing.

The first step in setting up the routing is to create a directory entry where the fax data mail can be sent. The displays in this section provide an example of how to add a system distribution directory entry for the user PKENNEDY.

To add an entry, use the *Work With Directory Entries* (WRKDIRE) command. Type WRKDIRE from the command line and press the **Enter** key. The following display, as shown in Figure 221, appears.

```
            Work with Directory Entries

Type options, press Enter.
  1=Add      2=Change   4=Remove   5=Display details   6=Print details
  7=Rename   8=Assign different ID to description   9=Add another description

Opt  User ID   Address   Description
 _   ________  ________
 _   AAA       FAX       fafadfa
 _   ACCOUNTS  FAX       ACME Accounts Receivable
 _   DSCHROED  NAME      Dennis Schroeder
 _   FAXDLE    FAX       Bad dist list
 _   FAXGCS    FAX       Fax to Grand Central
 _   FAXMLE    FAX       Grand Central 57574
 _   FAXMLE2   FAX       Team Office 57574
 _   FAXTELN   FAX       Phone number 57574
 _   HOCKEY    FAX       Test DST\\Entry
 _   IZZY      NAME      D49M, Izzy POP3 ID
 _   KLUCK     NAME      kluck directory entry
 _   KPS       NAME      Kevin Stamschror
                                                                      More...
F3=Exit      F5=Refresh   F9=Work with nicknames   F11=Sort by description
F12=Cancel   F13=Work with departments   F17=Position to   F24=More keys
```

Figure 221. Create a Directory Entry to Route the Fax Data Mail

Select option 1 (Add) on the Work With Directory Entries display and press **Enter**. The Add Directory Entry display appears, as shown in Figure 222. You must complete the fields on the Add Directory Entry display as they are described in this section. All of the fields for the Add Directory Entry display are not shown. You need to specify only the required fields (as shown in this section). Depending upon your needs, you may choose to enter optional information.

```
               Add Directory Entry

Type choices, press Enter.

  User ID/Address . . . .   PKENNEDY  NAMEXXX
  Description . . . . . .   Pat Kennedy
  System name/Group . . .   SYSTEMA               F4 for list
  User profile  . . . . .                        F4 for list
  Network user ID . . . .

  Name:
    Last  . . . . . . . .
    First . . . . . . . .
    Middle  . . . . . . .
    Preferred . . . . . .
    Full  . . . . . . . .

  Department  . . . . . .                        F4 for list
  Job title . . . . . . .
  Company . . . . . . . .
                                                                  More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F18=Display location details
F19=Add name for SMTP   F20=Specify user-defined fields
```

Figure 222. Complete Add Directory Entry

User ID/Address:
Enter the user ID and address for this entry. In our example, the user ID is PKENNEDY at Address SYSTEMA (where SYSTEMA is the name of the AS/400 system).

Description:
Enter a description for the user for whom you are adding this entry. In this example, this is Pat Kennedy.

System Name/Group:
Enter the system name and group in the same format as you entered the User ID and Address.

Network User ID:
Enter the network user ID in the same format as you entered the user ID and address. When you press **Enter**, the following message appears:

```
System name and group not found. Press enter to confirm.
```

This is not an error; ignore this message and press the **Page Down** key three times to continue. A display similar to the one in Figure 223 appears.

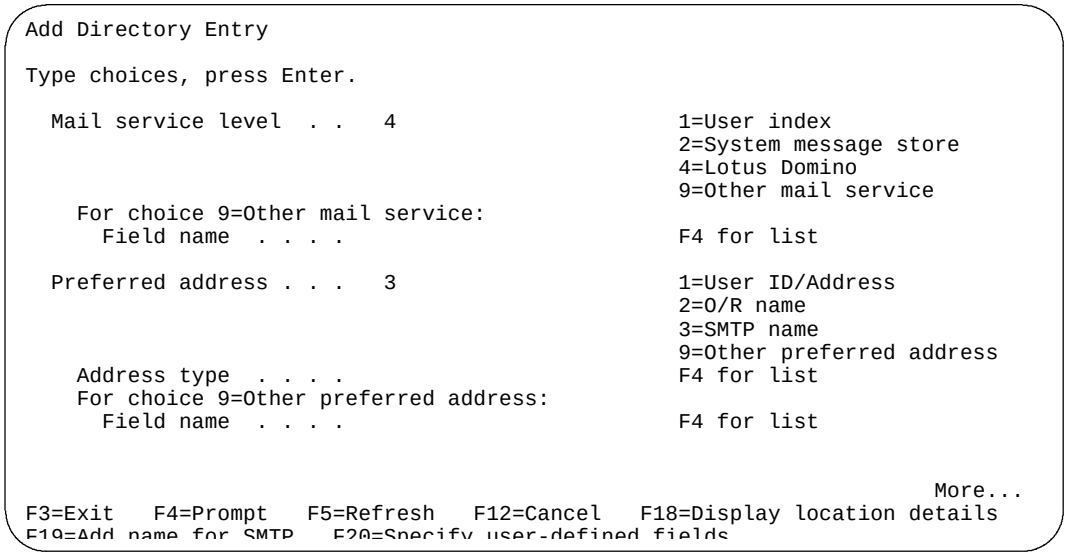

Figure 223. Complete Add Directory Entry Second Screen

Mail Service Level:
Select option **4** (Lotus Domino).

Preferred Address:
Select option 3 (SMTP Name) and press **F19** to enter the information for the SMTP Name as shown in Figure 224.

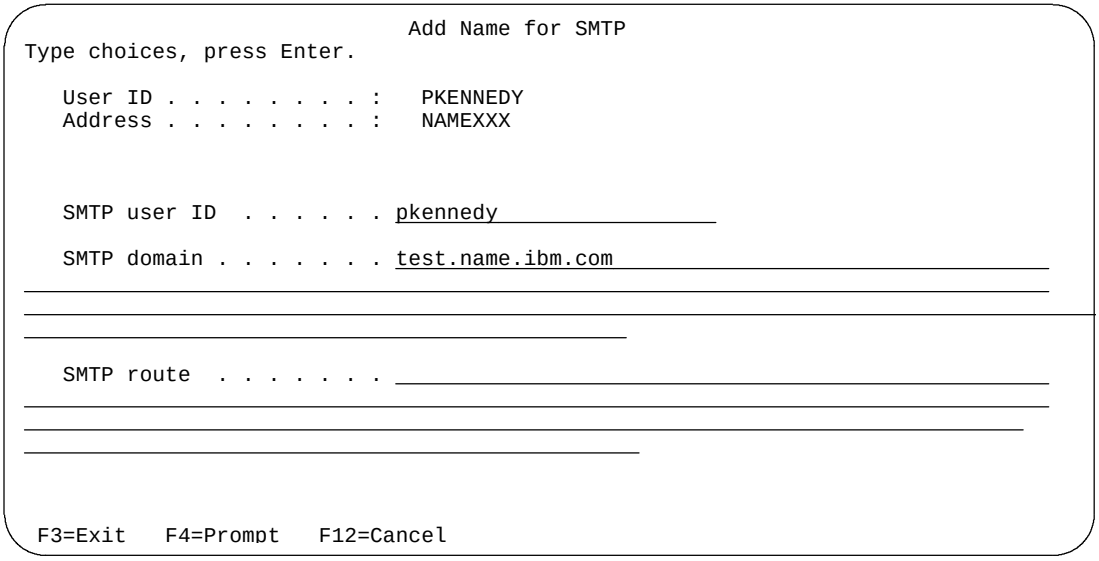
Add Name for SMTP
Type choices, press Enter.
User ID . . . . . : PKENNEDY
Address . . . . . : NAMEXXX
SMTP user ID . . . . . pkennedy
SMTP domain . . . . . test.name.ibm.com
SMTP route . . . . . .
F3=Exit F4=Prompt F12=Cancel

Figure 224. Add Name for SMTP

SMTP User ID:
Enter the name for the SMTP user ID for the system distribution directory entry that you are creating.

SMTP Domain:
Enter the correct information that pertains to your system. For more information about the SMTP domain, see the *TCP/IP Configuration and Reference* book, SC41-5420. Additional information is available via the AS/400 Online Library at: http://as400bks.rochester.ibm.com.

Press **Enter** to add the system distribution directory entry. You may need to press **Enter** more than once to complete the process.

Now that the system distribution directory entry has been created, you can customize your Facsimile Support for AS/400 to route faxes by tone, Transmitting Subscriber Identifier (TSI), or both.

Routing Using Received Tones

To route using tone, you need to configure the Facsimile Support for AS/400 Enhanced Services. Create a routing entry for each tone value that you want routed. You can do this by modifying the Fax Profiles that you created earlier, or by creating new Fax Profiles. For example, we modify the existing PKENNEDY Fax Profile.

To do so, type GO FAX at the command line. The Facsimile Support for AS/400 Main Menu appears. Select option 2 (Fax Profiles) and press **Enter**. The Fax Profiles menu appears as shown in Figure 225.

```
FAXPRF                          Fax Profiles
                                                          System:   SYSTEMA
 Select one of the following:

      1. Work with Fax Profiles
      2. Create Fax Profile
      3. Edit Fax Profile

 Selection or command
 ===>

 F3=Exit   F4=Prompt   F9=Retrieve   F12=Cancel   F13=Information Assistant
 F16=System main menu
```

Figure 225. Fax Profiles Menu

Select option 1 to Work with Fax Profiles and press the **Enter** key. The Work with Fax Profiles display appears. Locate the Fax Profile that you want to modify, or press **F6** to create a new fax profile. In this example, we modify the PKENNEDY profile that has already been created. Select 2 (edit) next to the profile that you want to edit and press **Enter**. The Edit Fax Profile display appears as shown in Figure 226.

```
Edit Fax Profile

 Type choices, press Enter.

   Profile Information:
      Profile name . . . . . . . . . . PKENNEDY
      Description  . . . . . . . . . . Pam Kennedy
      Administrator  . . . . . . . . . 1              1=Yes, 2=No
      Environment  . . . . . . . . . . 2              1=Basic, 2=Enhanced
      Routing code . . . . . . . . . . 4567

   Cover Page Information:
      Create cover page  . . . . . . . 1              1=Yes, 2=No
      Fax title  . . . . . . . . . . .
      From lines . . . . . . . . . . . Pam Kennedy


      Comment line . . . . . . . . . .

   Printer file  . . . . . . . . . . . QPFFCVP        QPFFCVP, Name
      Library  . . . . . . . . . . . .    QFAX        QFAX, *CURLIB, Name

 F3=Exit   F12=Cancel                                              More...
```

Figure 226. Edit Fax Profile

On the Edit Fax Profile display, input or modify the Routing code field. In our example, we input a routing code of 4567. Press **Enter** to make the change. You will return to the Work With Fax Profiles display. Select option 8 (Routing entries) and press **Enter**. The Work with Routing Entries display appears as shown in Figure 227.

```
Work with Routing Entries

Fax profile  . . . . . . . . : PKENNEDY

Routing code . . . . . . . . : 4567

Type option, press Enter.
  2=Edit entry   4=Remove entry

Opt   Routing Type          Description

     (No additional information found)


                                                                  Bottom
F3=Exit   F5=Refresh   F6=Create   F12=Cancel
(C) COPYRIGHT IBM CORP. 1995, 1998.
```

Figure 227. Work with Routing Entries

Press **F6** to create a routing entry. The Select Routing Entry display appears as shown in Figure 228.

```
Work with Routing Entries

                          Select Routing Entry Type

    Select one of the following:

    1)  Print received fax
    2)  File received fax
    3)  Send notification
    4)  Send fax as a document
    5)  Run user receive program

    Selection:

    F3=Exit   F12=Cancel

                                                                      Bottom
F3=Exit   F5=Refresh   F6=Create   F12=Cancel
```

Figure 228. Select Routing Entry Type

From the Select Routing Entry Type display, you can create as many routing entries as you want. To mail a received fax to Lotus Notes, you must create at least two routing entries. For the first routing entry, select option 2 (File Received Fax) and press **Enter**. The File Received Fax display appears as shown in Figure 229.

```
File Received Fax

 Fax profile . . . . . .: PKENNEDY

 Routing Code  . . . . . .: 4567


 Type choices, press Enter.

   Document  . . . . . *GENERATE    Name, *GENERATE
   Folder  . . . . . . RCVFAX

   Document type . . . . . *RFTDCAFAX   *RFTDCA, *MODCA, *RFTDCAFAX, *MODCAFAX
   Paper size  . . . . . *LETTER      *LETTER, *LEGAL, *A4, *B4
   Mapping value . . . . . *POSITION    *POSITION, *CENTER, *SCALE
   Delete fax  . . . . . 2            1=Yes, 2=No

 F3=Exit   F12=Cancel
```

Figure 229. File Received Fax

You can change any of the parameters for your environment. For this example, select the default parameters by pressing **Enter**. The *Work with Routing Entries* display appears, with the entry created as shown in Figure 230.

```
Work with Routing Entries

Fax profile  . . . . . : PKENNEDY

Routing code . . . . . : 4567

Type option, press Enter.
  2=Edit entry   4=Remove entry

Opt   Routing Type          Description

      *TONE-FILED           File received fax as *GENERATE in RCVFAX




                                                                  Bottom
F3=Exit   F5=Refresh   F6=Create   F12=Cancel
(C) COPYRIGHT IBM CORP. 1995, 1998.
```

Figure 230. Work Routing Entries Display for Changing Parameters

Press **F6** to create a second routing entry. The Select Routing Entry Type display appears as shown in Figure 231.

```
   Work with Routing Entries

                      Select Routing Entry Type

Select one of the following:

1)  Print received fax
2)  File received fax
3)  Send notification
4)  Send fax as a document
5)  Run user receive program

Selection:           4

F3=Exit   F12=Cancel
```

Figure 231. Select Routing Entry Type

Select option **4** (Send fax as a document) and press **Enter**. The Send Document display appears as shown in Figure 232.

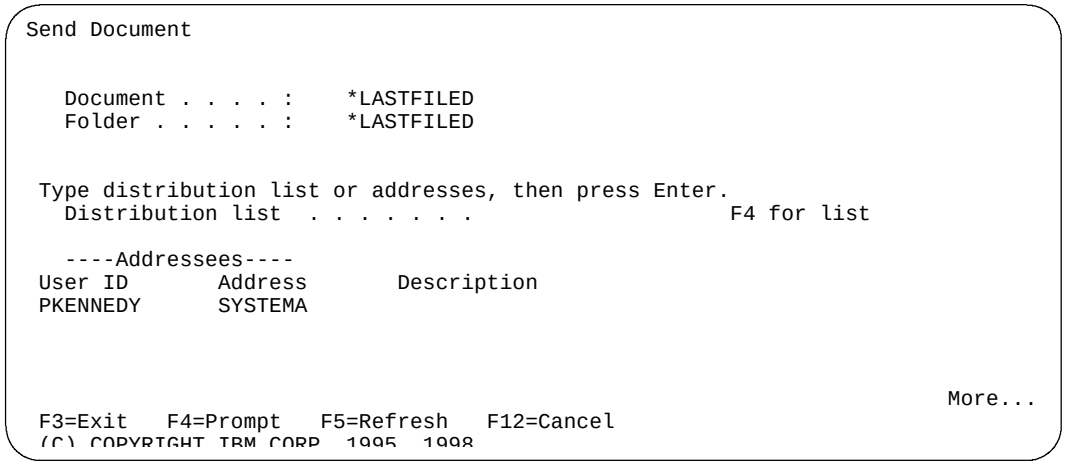
Send Document
Document . . . . : *LASTFILED
Folder . . . . . : *LASTFILED
Type distribution list or addresses, then press Enter.
Distribution list . . . . . F4 for list
----Addressees----
User ID Address Description
PKENNEDY SYSTEMA
More...
F3=Exit F4=Prompt F5=Refresh F12=Cancel
(C) COPYRIGHT IBM CORP. 1995, 1998

Figure 232. Send Document Display

User ID:
Enter the name of the system distribution directory entry that you created earlier. In our example, the user is PKENNEDY.

Address:
Enter the name of the address. In our example, this is SYSTEMA.

Press the **Enter** key to create the routing entry. The entry is created and you can return to the Work With Routing Entries display. Add additional routing entries, or press **F12** to return to the Work with Fax Profiles display.

Now, when a fax is received with a tone value of 4567, it is filed as a document in a folder. The document is mailed to Lotus Notes user PKENNEDY.

Note For this to happen, you need to configure the Configure Fax Services (CFGFAXSRV) command and set the Start Fax Routing parameter to *YES. Refer to the Facsimile Support for AS/400 Programmer's Guide and Reference for more information about the CFGFAXSRV command. Also, make sure to start Facsimile Support and Enhanced Services with the STRFAXSPT command.

Routing Using the Transmitting Subscriber Identifier (TSI)

In addition to routing by tone (as described in the previous section), you can use the Transmitting Subscriber Identifier (TSI) to route information.

Most fax machines are configured to send some kind of identification along as part of the fax transmission. The identification may be the fax telephone number or the company name. With Facsimile Support for AS/400, you can route faxes based on the TSI value.

You can route a received fax to Lotus Notes mail by configuring routing entries in Enhanced Services. This section explains how to create routing entries for the TSI

value. You also need to create a system distribution directory entry. Earlier in this chapter, a system distribution directory entry called PKENNEDY was created. We refer to that system distribution directory entry in this section. If you have not created a system distribution directory entry, you need to do so.

To route using TSI, configure the Facsimile Support for AS/400 Enhanced Services. You also need to create routing entries. To do this, type WRKTSIRTG (Work With TSI Routing) at the command line, and press **Enter**. The Work With TSI Routing display appears as shown in Figure 233.

```
                              Work with TSI Routing

Position to . . . . .

Type option, press Enter.
  1=Work with entries  2=Edit TSI Code

Opt   Destination Name               TSI Code

      AA
      ABC OFFICE FURNITURE CO
      ABC OFFICE FURNITURE CO
      ABILIENE CHRISTIAN
      ACE                            FAX TEAM 123
      ACE2
      ADAMS STATE                    555555
      ADELPHI
      ADRIAN                         5071237890
      AKRON                          5071234567
      ALABAMA                        5071239876
                                                                        More...
F3=Exit   F5=Refresh   F10=Display Messages   F11=View 2
F12=Cancel
(C) COPYRIGHT IBM CORP. 1995, 1998.
```

Figure 233. Work with TSI Routing

Edit the TSI Code for the Master List Entry from which you receive faxes. In our example, we edit the TSI code for the Master List Entry ALBANY by selecting option **2** (Edit TSI code). Select option **2** and press **Enter**. The Edit TSI Code display appears as shown in Figure 234.

```
Edit TSI Code


 Destination information:
    Name . . . . . . . . . . . : ALBANY
    Identifier . . . . . . . . : GREAT DANES
    Entry  . . . . . . . . . . : *DEFAULT
    Contact  . . . . . . . . . :
    Telephone  . . . . . . . . :
    Fax number . . . . . . . . : 57577


 To change TSI Code, change New TSI Code and press Enter.
    Current TSI Code              New TSI Code
    5079871234                    5079871234



 F3=Exit   F12=Cancel
```

Figure 234. Edit TSI Code

In our example, we enter a TSI code of 5079871234. Another example is "Albany Office" if that is the TSI from the sending fax machine. After inputting the TSI code, press **Enter**. You return to the Work with TSI Routing display as shown in Figure 235.

```
  Work with TSI Routing

Position to . . . . .

Type option, press Enter.
  1=Work with entries  2=Edit TSI Code

Opt   Destination Name              TSI Code

      ALABAMA A&M
      ALABAMA BIRMINGHAM
      ALABAMA HUNTSVILLE
      ALABAMA STATE
      ALASKA ANCHORAGE
      ALASKA FAIRBANKS
      ALBANY                        5079871234
      ALBANY PHARMACY
      ALBANY STATE
      ALBERTSON
      ALBERTUS MAGNUS
                                                                    More...
F3=Exit   F5=Refresh   F10=Display Messages   F11=View 2
F12=Cancel
```

Figure 235. Work with TSI Routing

Now that the TSI code is updated, you can create your routing entries. Select option 1 (Work with Routing Entries) and press **Enter**. The Work with Routing Entries display appears as shown in Figure 236.

```
Work with Routing Entries

 Destination  . . . . . . . . . : ALBANY
 Identifier/Entry . . . . . . . : GREAT DANES/*DEFAULT
 TSI code . . . . . . . . . . . : 5079871234

 Type option, press Enter.
   2=Edit entry   4=Remove entry

 Opt   Routing Type          Description

       *TSI-FILED            File received fax as *GENERATE in RCVFAX
       *TSI-SNDDOC           Send fax as document to PKENNEDY SYSASD2V



                                                                    Bottom
 F3=Exit   F5=Refresh   F6=Create   F12=Cancel
 (C) COPYRIGHT IBM CORP. 1995. 1998.
```

Figure 236. Work with Routing Entries

Press **F6** to create a routing entry. The Work with Routing Entries display appears as shown in Figure 237.

```
Work with Routing Entries


                          Select Routing Entry Type

    Select one of the following:

    1)  Print received fax
    2)  File received fax
    3)  Send notification
    4)  Send fax as a document
    5)  Run user receive program

    Selection:

    F3=Exit   F12=Cancel

                                                                    Bottom
 F3=Exit   F5=Refresh   F6=Create   F12=Cancel
```

Figure 237. Work with Routing Entries

From this display, you can create as many routing entries as you need. To mail a received fax to Lotus Notes, create at least two routing entries. For the first routing entry, select option **2** (File Received Fax) and press **Enter**. The File Received Fax display appears as shown in Figure 238.

```
                          File Received Fax

Destination name  . . . . . .: ALBANY
Identifier/Entry  . . . . . .: GREAT DANES/*DEFAULT
TSI code  . . . . . .: 5079871234


Type choices, press Enter.

  Document  . . . . . . . . *GENERATE    Name, *GENERATE
  Folder  . . . . . . . . . RCVFAX

  Document type . . . . . . *RFTDCAFAX   *RFTDCA, *MODCA, *RFTDCAFAX, *MODCAFAX
  Paper size  . . . . . . . *LETTER      *LETTER, *LEGAL, *A4, *B4
  Mapping value . . . . . . *POSITION    *POSITION, *CENTER, *SCALE
  Delete fax  . . . . . . . 2            1=Yes, 2=No



F3=Exit   F12=Cancel
```

Figure 238. File Received Fax

You can change any of the parameters for your environment. For this example, we select the default parameters by pressing the **Enter** key. You return to the Work with Routing Entries display, as shown in Figure 239.

```
                        Work with Routing Entries

 Destination  . . . . . . . . : ALBANY
 Identifier/Entry . . . . . . : GREAT DANES/*DEFAULT
 TSI code . . . . . . . . . . : 5079871234

 Type option, press Enter.
   2=Edit entry   4=Remove entry

 Opt   Routing Type          Description

       *TSI-FILED            File received fax as *GENERATE in RCVFAX
       *TSI-SNDDOC           Send fax as document to PKENNEDY SYSASD2V
       *TSI-FILED            File received fax as *GENERATE in RCVFAX


                                                                      Bottom
 F3=Exit   F5=Refresh   F6=Create   F12=Cancel
 Routing entry type *TSI-FILED has been created
```

Figure 239. Work with Routing Entries

Press the **F6** key to create a routing entry. The Work with Routing Entries display appears as shown in Figure 240.

```
Work with Routing Entries

                          Select Routing Entry Type

    Select one of the following:

    1)  Print received fax
    2)  File received fax
    3)  Send notification
    4)  Send fax as a document
    5)  Run user receive program

    Selection:

    F3=Exit   F12=Cancel

                                                                      Bottom
 F3=Exit   F5=Refresh   F6=Create   F12=Cancel
```

Figure 240. Select Routing Type

Select option **4** (Send fax as a document) and press **Enter**. The Send Document display appears as shown in Figure 241.

```
                                Send Document


  Document . . . . :    *LASTFILED
  Folder . . . . . :    *LASTFILED


Type distribution list or addresses, then press Enter.
  Distribution list  . . . . . .                    F4 for list

  ----Addressees----
User ID       Address       Description
PKENNEDY      SYSTEMA
_________     _________
_________     _________
_________     _________
_________     _________
_________     _________                                          More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel
(C) COPYRIGHT IBM CORP. 1995, 1998.
```

Figure 241. Send Document

User ID:
Enter the name of the system distribution directory entry that you created earlier. In our example, the user ID is PKENNEDY.

Address:
Enter the name of the Address. In our example, this is SYSASD2V.

Press **Enter** to create the routing entry. The entry is then created and you can return to the Work with Routing Entries display. You can either add more routing entries, or press **F12** to return to the Work With TSI Routing display.

Now when a fax is received from 5079871234, it is filed as a document in a folder. That document is then mailed to the Lotus Notes user PKENNEDY.

Note For this to happen, you need to configure the *Configure Fax Services* (CFGFAXSRV) command and set the Start Fax Routing parameter to *YES. Refer to the Facsimile Support for AS/400 Programmer's Guide and Reference for more information about the CFGFAXSRV command. Also, make sure to start Facsimile Support and Enhanced Services with the STRFAXSPT command.

File to TIFF Class-F for Viewing in Lotus Notes

If you file a fax using the shipped V4R2 Facsimile Support for AS/400 File Fax (FILFAX) command, and then route the document to a Lotus Notes user via Domino for AS/400 using the *Send Document* (SNDDOC) or *Send Distribution* (SNDDST) command, the fax is shown as an attachment in Lotus Notes.

Presently, the only way to view a fax that is routed this way is to detach the attachment and use the Client Access/400 AFP Workbench Viewer. If you followed the directions in the sections titled "Routing Using Received Tones" on page 400 or "Routing Using the Transmitting Subscriber Identifier (TSI)" on page 405, you can only view the fax by detaching the attachment and using the Client Access/400 AFP Workbench Viewer.

There is another way to be able to view the fax and use the Lotus Notes viewer. You would need to load and apply Facsimile Support for AS/400 (5798-TBY) PTF SF49013.

Note If you load and apply PTF SF49013 and use the command listed below, you will not be able to have faxes routed by Facsimile Support for AS/400 to Lotus Notes using the QFFTIFFC program. Automatic routing of received faxes can still be accomplished as described in "Routing Using Received Tones" on page 400 or "Routing Using the Transmitting Subscriber Identifier (TSI)" on page 405. If you use the QFFTIFFC program, you must route the faxes to Lotus Notes yourself using the SNDDOC or SNDDST commands.

Once PTF SF49013 is loaded and applied, you can file a received fax using the command as shown in the following example. This files the received fax as a TIFF Class-F format from an AS/400 command line:

```
CALL QFAX/QFFTIFFC
 parm('/QSYS.LIB/QUSRSYS.LIB/QAFFRCV.FILE/F123456789.MBR'
      '/QDLS/ACCOUNTS/TIFFDOC1' 't')
```

The parameters must be entered as shown above. You should substitute values as appropriate for your received faxes. Using the above example, parameter values are defined as:

- `QAFFRCV.FILE`—Facsimile Support for AS/400 receive file name.
- `F123456789.MBR`—The file member containing the received fax you want to store as a TIFF Class-F document.
- `ACCOUNTS`—Folder to store document.
- `TIFFDOC1`—Document name (must be unique and no more than 8 characters).
- `t`—Use ‘t’ to file as TIFF Class-F to be viewed by the Lotus Notes viewer and most other viewing software. Use ‘f’ to file as TIFF Class-F to be viewed by the System Application Program (SAP) AL Viewer.

Once you have filed the received fax in a TIFF Class-F format, you could use the SNDDOC or SNDDST command to route the document to Lotus Notes/Domino. Your Lotus Notes viewer can be used to view the fax (the fax will show up as an attachment in your viewer).

The command shown above could be incorporated into an application written by the end-user.

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Appendix B
The IBM Rochester Experience

A Report by Todd Grube, IBM Global Services, Rochester

In a bold decision to "eat its own cooking", the IBM Rochester Development laboratory became a huge experimental kitchen (a.k.a. Beta site) for Domino for AS/400. At the time of this writing (May, 1998), IBM Rochester is by far the largest Domino for AS/400 installation in the world. Here is the story of why we did it, what we did, how we did it, and the results that we have seen.

Migrating to Domino for AS/400 — the Rationale

Late in 1997, two projects were going full tilt:

- the development of Domino for AS/400 (the native AS/400 implementation of Domino) in Rochester, Minnesota and Cambridge, Massachusetts,
- and the migration of the entire IBM internal e-mail infrastructure from PROFS and OfficeVision/VM to Lotus Notes clients and Domino servers.

At the same time, two groups got together and decided to throw another ingredient into the mix by making the entire Rochester Development Lab a Beta site for Domino for AS/400. The master chefs were the IBM Global Services team responsible for implementing and supporting Notes/Domino in Rochester (of which I am a part) and the development team for Domino for AS/400. Here's the rationale behind the decision:

- **Belief and a leap of faith.** The experienced Notes administrators in Rochester chose to implement a small Beta test. We migrated thirty production mail users to Domino for AS/400 in November 1997. We rapidly began to see the Domino for AS/400 value proposition at work. We had a vision of how the product would change (and improve) our role as Notes administrators. And we believed the benefits we were already seeing would grow exponentially with a larger number of users. We made a leap of faith and proposed migrating the entire Lotus Notes mail infrastructure for over 7,500 people in Rochester to Domino for AS/400 even before general availability of the product in February 1998.

- **An opportunity for thorough, comprehensive testing.** The development team buried any apprehensions they had about their new product and welcomed the opportunity for such rigorous testing. After all, IBMers are notorious as very heavy e-mail users. What better way to test the performance limits, scalability, and messaging infrastructure of Domino for AS/400 than to let 7,000 users pound away at it? This early testing was especially welcome in light of the development team's other bold initiative: to have Domino for AS/400 provide the e-mail infrastructure at Lotusphere in January 1998, a month before general availability of the product. They believed in their efforts and were committed to trial by fire, in the public eye.
- **An ongoing test kitchen.** Testing is always a challenge. Even the best-designed regression tests can't predict all the nuances of production use. This large installation in their own backyard provides the Domino for AS/400 developers with the opportunity for "production testing" of quarterly maintenance updates and releases (QMUs and QMRs[72]) before they become generally available. We have set aside one Domino server, with over 300 production users, to be on the "bleeding edge" for trying out new function and code fixes.

Migrating to Domino for AS/400 — the Configuration

Before we began our migration to Domino for AS/400, our Rochester site supported approximately 7,000 e-mail users on 40 Domino PC servers with a total of 87 Intel processors (i.e., some of the machines were multi-processors -- 2-way, 4-way, etc.):

- 23 PC servers running OS/2 Warp SMP
- 17 AS/400 Integrated PC Servers

After we completed the migration of our Notes e-mail infrastructure to Domino for AS/400, our Rochester site is supporting approximately 7,000 e-mail users with 3 AS/400 systems:

- Model S40 (12-way)
- 10GB memory
- Up to 16 partitioned Domino servers on each AS/400
- CPU utilization of approximately 25%
- 700-800 users per partition
- 1 "hot backup" partition on each AS/400

[72] For those new to Lotus Notes and Domino, a QMU is roughly equivalent to an AS/400 cumulative PTF tape. QMUs are available for download via the Web and provide fixes to known problems. QMRs are delivered on a scheduled basis (once per quarter) to customers who buy Lotus software subscription for Domino, and they often include new function as well as fixes.

As the migration progressed, our site initially used more than 10 partitioned Domino servers on each of the 3 AS/400's. After the mail migration was complete, we consolidated logical servers as well as physical processors and currently have 14 partitioned Domino servers spread across the 3 systems -- one AS/400 supporting nearly 3,500 mail users and the other two supporting roughly 2,000 mail users apiece.

In addition, we are currently migrating all of our Notes/Domino applications (non e-mail) from other servers to these same three AS/400 servers. This represents more than 2,000 databases. By the end of June 1998, we will complete the consolidation of a total of 50 production PC servers into three AS/400 systems model S40 supporting approximately 7,500 production users, over 3,500 of which are database users as well as mail. When this process is complete, the 36 AS/400 processors in three machines will have replaced a total of 102 Intel processors.

Migrating to Domino for AS/400 — the Methods

In the course of migrating our 7,000 e-mail users, we used two different migration methods: mail server consolidation and mail server transplantation. Whether the existing servers were on outboard machines or on Integrated PC Server cards within an AS/400, the approaches were essentially the same. Following are descriptions of the two methods and their trade-offs.

Mail-Server Consolidation Method

With this approach, we moved users to a new logical mail server. This means that not only did the server reside on different hardware (AS/400 vs. Intel processor), but it had a completely new entity from a Domino standpoint. For example, during a weekend, we moved users from Domino servers MAIL01 and MAIL02 on PC servers to Domino server MAIL23 on an AS/400 server.

We started with this approach for three reasons:

- It is the correct, supported approach for mail migration.
- It matched our end goal of a smaller number of logical servers as well as physical machines.
- It gave us the opportunity to test the optimum number of registered mail users for a Domino server.

Our initial goal with this method was to assign 1,100 to 1,200 registered mail users to each partitioned Domino server on our AS/400s. However, we encountered stability problems with this many users assigned to a single server. Because our CPU utilization typically ran at less than 35%, we suspected this was an inherent limitation in the scalability of Domino, not an AS/400 limitation. Other large-scale Domino users on other platforms have experienced similar limitations. We gradually reduced the number of registered users on our Domino servers and

discovered that a maximum of 700 to 800 registered users in a partition provided the best performance and stability. We now use this as our guideline.

Here are the basic steps for the server consolidation method:

- Configure a new Domino server on AS/400 with a unique TCP/IP address and server identity different from the existing Intel server.
- Use File Transfer Protocol (FTP) to copy the appropriate users' mail files from the existing server to the new.
- Identify any mail files with local encryption which require special handling.
- Use server-to-server replication to keep the old and the new mail files synchronized until complete cut-over to the new server has taken place.
- Change users' information in Public Address Book to reflect the mail server change.
- Change location documents on the users' workstations to reflect the home mail server change.

Success with server consolidation requires administrator focus in the following key areas. Our findings and techniques are discussed in the "Challenges" section of this paper.

- Managing impact on customers (users). This is the most important aspect of any migration.
- Developing and testing methods for moving mail without integrity problems or long server outages.
- Managing mass changes to the Public Address Book. (The Public Address Book for the IBM U.S. domain has over 150,000 entries. Mass changes are a very big issue.)

By the end of December 1997, we had used this method to move the first 400 users to AS/400 servers in a couple of iterations. These were a pilot group which actually consisted of a handful of users from many servers in varying departments and geographies.

Mail Server Transplantation Method

As we completed the first several phases of our migration and felt comfortable with our Domino for AS/400 servers, we wanted a faster way to move the rest of our population to AS/400 servers. We began creating AS/400 versions of existing Domino servers. For example, we would create a MAIL08 partitioned server on an AS/400 that represented a duplicate of the MAIL08 Domino server on a PC platform. We could then move the entire MAIL08 user community without requiring any actions by the users. Here are the basic steps for this method:

- Create the Notes data directory for the new AS/400 version of the server and copy the Public Address Book into it (using FTP or the AS/400 "network

neighborhood" capability). This avoids possible problems with duplicate active Domino servers.

- Configure the Domino server on AS/400. Use the same TCP/IP address as the existing PC server. Do not start the newly configured server or its TCP/IP interface.
- Schedule an outage on the PC Domino server long enough to move all the mail files and verify them (so mail files are not being updated while this process is taking place).
- Use File Transfer Protocol (FTP) to copy all the mail files from the existing server to the AS/400, using a different IP address for the same physical machine.
- After moving the files and verifying them, end the existing Domino server (on the PC platform).
- Start the TCP/IP interface and the new Domino server on the AS/400. Because it has the same TCP/IP address, the server change should be transparent to the users. (Their mail will still be on MAIL08 with the same TCP/IP address. It will simply be on a different, more available physical server.)
- Verify with a handful of test users to ensure that they can access the new server without any changes to their Notes client.

We used this method to move the balance of the 7,000 users in 10 business days. We became so comfortable with this technique that the last night we transplanted four servers with a total of 800 users. Since then, we have used the server consolidation technique to gradually consolidate these users into fewer partitioned Domino servers to simplify our server management job. However, the server transplantation method worked wonderfully to accomplish our original objective: rapidly moving a large number of users to Domino for AS/400 with minimal disruption to the user community.

Migrating to Domino for AS/400 — the Challenges

The server consolidation method offers the benefits of minimized down time during the migration and, as the name suggests, a smaller number of servers at the completion of the process. Our experience brought to light some administrative challenges, which led us to the transplantation method as a desirable first phase in moving users to the AS/400 hardware platform, followed by consolidation of logical servers. Understanding and managing these challenges is critical to success in server consolidation, regardless of whether you choose a one-step or two-step process. I'd like to share our experience and the techniques we devised for meeting the challenges, particularly in minimizing the impact to the end user.

Moving the Data

Our server consolidation process involved using FTP early in the week of a migration to copy mail data from the original Domino server to its new home on AS/400. Technically, replication could be used for this purpose as well. We used FTP because we found it to be much faster and more straightforward for our purposes in bulk copying mail files for selected users or large numbers of users.

We discovered one tradeoff, though, for the speed benefit of using FTP vs. replication. In order to move open files with FTP from the existing Domino server, we occasionally needed to use a server trick. We would execute a `dbcache flush` followed by a `drop all` from the Domino server console to try to gain access and copy as many files as possible without having to take the Domino server down for any length of time.

With this technique, we were able to accomplish our goal with minor side effects as opposed to a server outage. For example, if a user interacted with the server at the exact moment the DROP ALL command was issued, they might receive an error message, but if they immediately retried the function, it would be successful. Users not actively communicating with the server at that moment may have experienced a little bit longer connect time the next time they accessed the server.

We found that since the new Domino server has a completely different identity, including encryption keys, it would be denied access to any copied mail files that had local encryption set!

Once we had all the mail files copied to the new server, we used the `FIXUP` command from the new Domino server console to identify any mail files in this situation. If results of `FIXUP` identified that the new Domino server did not have access to specific databases, we would manually create a new replica of each of those databases on the new server, using a Lotus Notes client interface. Through the replication process, Notes allows this encryption key to be rebuilt. We then verified that all the mail data had been successfully copied and accessible by the new Domino server.

All that remained for data migration was to replicate the existing Domino server with the new Domino server once a day throughout the remainder of the week to keep the two versions of the mail data synchronized. After updating the Public Address Book (discussed in the next section) to reflect the change in mail servers, all that was required was one final replication of the old and new Domino servers. From a data perspective, this process provided uninterrupted service which was vital to our users.

Administering the Public Address Book

When the location of a user's mail database is moved from one logical Domino server to another, changes need to be made to the Public Address Book, which the Domino mail router references to deliver the mail, and to the user's location

document, which defines how the user's mail is sent and received. We devised a detailed process for managing the end user changes (described below under "Managing user communications"). On Friday morning of the migration week, we would modify the Public Address Book to change the mail server and, if necessary, the mail file path for each user being migrated.

If you were migrating all users from a given server, this could be done with a simple agent. In a case like ours, with a pilot group of users migrating from different servers, a manual approach might be more straightforward. We would perform 400-600 Public Address Book updates in one weekend. It would take us approximately 4 to 5 hours to perform these updates by hand.

Managing User Communications

The most important aspect of a migration, or any major change, is managing the impact to the end user. We've discussed how we migrated our data without impacting our users. We also need to explain how we implemented the changes required on the users' own workstations to use their new Domino mail server. On Wednesday morning, we would send out the first of three memos to the users who were to be migrated. This communication included an announcement of the imminent migration: who, what, where, when, and why. We included a button in this memo which added icons for key databases on the new Domino server, such as the Public Address Book and a local Distribution List database. We found that by having the end users add these large databases to their desktops prior to the Monday morning peak load which always follows a migration, we were able to balance the load on the new Domino server.

As explained earlier, on Friday morning we flipped the switch to the new mail server by updating the Public Address Book documents for each migrated user. Once this update was complete, we sent out a second memo to the affected users including a button and some detailed instructions. The button caused their location document in their personal address book to be updated, and added an icon to their workspace for the new mail database. The instructions explained how to manually replicate their new mail database with the old one, in case they have been manipulating their old mail file after the Public Address Book changes were made and the final replication was performed. Over the weekend, we would send out a third and final note to our users. It simply congratulated the users on making the move. More importantly, by sending this final note, we were able to quickly identify if any users were experiencing mail routing problems.

It is important to note that the client workstation modifications are needed only with server consolidation (moving the users to a server with a different identity). In the case of server transplantation, the migration for those users was completely transparent to them. To keep these users informed, we had notified them in advance that they would soon be moved to the native AS/400 version of Domino. A few weeks later, users began calling to ask "When do I begin using the AS/400?"

They had, in fact, been moved weeks earlier and never even knew it because they never experienced any downtime or interruption in service!

Implementing Backup and Recovery Strategies

Backup and recovery are important considerations when migrating any application from one platform to another, and Domino for AS/400 is no exception. Functions and alternative methods tend to vary by platform. While moving to the AS/400, we found there are a couple of different methods for backing up your Domino data. The appropriate backup and recovery strategy for your environment primarily depends on whether you need 24 x 7 Domino server availability.

Certain key Domino databases, such as the Public Address Book are always open while the Domino server is operational. A save-while-active solution is not currently available on the AS/400 platform. If you do not need around the clock availability, you can simply take down your Domino server and use the AS/400's built backup capabilities to back up your data directories. For installations that have large amounts of data or require unattended backup, the Backup and Recovery Management Services (BRMS) software and a tape library system provide a good solution. If you do need 24 x 7 availability, there are various approaches to mirroring your data. One is to use the Domino clustering capability available with a specialized server license that includes advanced functions. A second is to use some sort of data replication scheme.

In our case, we set up a Domino partitioned server on each AS/400 specifically for backup. Twice a day, all user data is replicated to this backup partition from the live Domino server partitions on the AS/400. Nightly, we bring down this specific partition and back it up via BRMS. The administration team are the only users who have access to these backup servers. Unlike the clustering approach, this does not provide failover, but this provides online hot backup which is accessible on demand if needed. We also maintain up to thirty days of backup on offline media. At this time, we are not using clustering because this feature is not currently part of the blueprint for the IBM deployment of Lotus Notes, of which we are a part.

Migrating to Domino for AS/400 — the Results

If you have seen the “hype” surrounding Domino for AS/400, you undoubtedly have heard about the major benefits of this product: scalability, reliability, and performance. The results of our migration project represent a real life testimonial to these claims.

First, Scalability...

It has been our experience that Domino for AS/400 scales in multiple ways. We have scaled the total number of registered users per AS/400 to over 3,500 users. Assuming that 60-70% are active at any given time, this equates to over 2,500

concurrent users on a consistent basis. At peak times, we exceed 3,000 concurrent users. These users typically route over 400,000 pieces of mail per week, many with attachments. Average CPU utilization on this system is 30 to 35%.

We have scaled the number of partitioned Domino servers up to sixteen per AS/400. This includes a mix of mail and application servers. And finally, we have scaled the number of registered users on a single partition to 800 with great success. This scalability simply makes our lives as administrators simpler, because there is less hardware to manage. We moved from over 40 pieces of hardware to 3. Our monthly administration costs decreased by roughly 35%. Since our administrative workload is significantly reduced, we now have time to perform more consulting and perform services for our customers.

Next, Reliability...

From a hardware perspective, the move to AS/400 has equated to a significant improvement in operating system and hardware reliability. In the past five months, we have experienced no hardware failures, and only one AS/400 operating system failure. It is important to note that this one operating system failure occurred with pre-released software. Remember that we began our migration prior to general availability of either Domino for AS/400 or OS/400 V4R2.

From a Domino server availability standpoint, we have gone from nightly reboots of our PC servers to weekly recycles of our Domino for AS/400 servers to allow compaction of the Public Address Book. Many of our servers have been running for more than twenty days without a glitch — a record previously unheard of in our network of PC servers. On the occasions (though rare) where we have experienced Domino server panics, the error monitoring and automatic server recycling feature of Domino for AS/400 have worked very well for us in minimizing administrator intervention and down time.

Another interesting trend which we are experiencing is seen when comparing our May ’98 to November ’97 server outage numbers. We have cut the duration of our prime shift outages by 70% and our off-shift outages by 82%. Also, we have cut the average length of our outages during prime shift from 32 minutes per outage in November ’97 to 12 minutes per outage in May ’98 and our off-shift outages have gone from 61 minutes per outage to 13 minutes per outage.

Finally, Performance...

This characteristic is what really got us excited when we first started testing Domino for AS/400. Our implementation is part of the IBM United States Notes deployment. This Notes domain is probably one of the largest and most complex in existence. Our Public Address Book has more than 150,000 documents and is over 1.3GB in size. As you can imagine, managing a Public Address Book of that size can be a challenge. In our pre-Domino for AS/400 environment, replication of the Public Address Book needed to be scheduled for an overnight run because of the

amount of time required -- up to 6 hours. In fact, the number of changes needed to be limited to 3,000 at a time or the replication would not complete within the 6 hour window.

In an initial Domino for AS/400 replication test, we allowed a server to take on over 6,000 changes to its Public Address Book. It finished the replication in about 40 minutes and finished the re-indexing task in about 50 minutes. If we weren't already sold on Domino for AS/400, that definitely sold us! In general, on our large AS/400s, we have been able to scale the number of replicators, indexers, and routers to truly meet the needs of our enormous environment. A final point on performance, even with the Domino load which we have put on our AS/400's, the average CPU utilization hovers around 30%.

Besides scalability, reliability, and performance, another significant benefit is the ability to perform true remote administration of your Domino servers. Since Domino for AS/400 is running as an AS/400 application, the Domino server console is also running on the AS/400. Therefore, from an AS/400 emulation session, you can work on the true console even when the server is starting and stopping -- a big advantage over the limitations of the remote server console function of the Notes client administration interface. Administrators also have the unique ability to edit the server's NOTES.INI file from anywhere in the world using the Operations Navigator interface. As long as you have access to the AS/400, you have complete control of your servers. Try making a TCP/IP change to a remote system on any other platform -- this is a real AS/400 advantage. In fact, we administer the Domino for AS/400 environment from our desks in buildings ¾ of a mile from the physical server location!

The experiment in our test kitchen has been highly successful, and we are happy to share our recipes with you, our customers, via briefings, papers, and contract services. Stay tuned for new recipes on DB2/400 integration as we complete the migration of our non-mail applications. Hopefully, we've given you plenty of food for thought and have whet your appetite to enjoy the fruits of a successful implementation of Domino for AS/400 in your own environment.

Special Notices

This publication is intended to help you deploy Domino for AS/400 Release 4.6.

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Related ITSO Publications

This section lists other Lotus related publications produced by the International Technical Support Organization (ITSO). For information on ordering these ITSO publications, see "How To Get ITSO Redbooks."

ITSO Lotus Publications

- *Lotus Notes 4.5: A Developers Handbook*, IBM form number SG24-4876-00, Lotus part number AA0425
- *LotusScript for Visual Basic Programmers*, IBM form number SG24-4856-00, Lotus part number 12498
- *Secrets to Running Lotus Notes: The Decisions No One Tells You How to Make*, IBM form number SG24-4875-00, Lotus part number AA0424
- *Enterprise Integration with Domino.Connect*, IBM form number SG24-2181-00, Lotus part number 12913
- *Deploying Domino in an S/390 Environment*, IBM form number SG24-2182-00, Lotus part number 12957
- *Guide to Deploying Domino Go Webserver*, IBM form number SG24-2002-00, Lotus part number 12991
- *Developing Web Applications Using Lotus Notes Designer for Domino 4.6*, IBM form number SG24-2183-00, Lotus part number 12974
- *The Next Step in Messaging: Case Studies on Lotus cc:Mail to Lotus Domino and Lotus Notes*, IBM form number SG24-5100-00, Lotus part number 12992

Redbooks on CD-ROMs

Redbooks are also available on CD-ROMs. Order a subscription and receive updates 2-4 times a year at significant savings.

CD-ROM Title	*Subscription Number*	*Collection Kit Number*
Lotus Redbooks Collection	SBOF-6899	SK2T-8039
Tivoli Redbooks Collection	SBOF-6898	SK2T-8044
Application Development Redbooks Collection	SBOF-7290	SK2T-8037

RS/6000 Redbooks Collection (PostScript)	SBOF-7205	SK2T-8041
RS/6000 Redbooks Collection (HTML, BkMgr)	SBOF-7230	SK2T-8040
RS/6000 Redbooks Collection (PDF)	SBOF-8700	SK2T-8043
AS/400 Redbooks Collection	SBOF-7270	SK2T-2849
Transaction Processing and Data Management Redbook Collection	SBOF-7240	SK2T-8038
Networking and Systems Management Redbooks Collection	SBOF-7370	SK2T-6022
System/390 Redbooks Collection	SBOF-7201	SK2T-2177

Other Lotus Related ITSO Publications

The publications listed in this section may also be of interest:

- *AS/400 Electronic-Mail Capabilities*, IBM form number SG24-4703-00
- *Mail Integration for Lotus Notes 4.5 on the IBM Integrated PC Server for AS/400*, IBM form number SG24-4977-01
- *Using Lotus Notes on the IBM Integrated PC Server for AS/400*, IBM form number SG24-4779-00
- *The Domino Defense: Security in Lotus Notes and the Internet*, IBM form number SG24-4848-01, Lotus part number 12967
- *Lotus Solutions for the Enterprise, Volume 1. Lotus Notes: An Enterprise Application Platform*, IBM form number SG24-4837-00, Lotus part number 12968
- *Lotus Solutions for the Enterprise, Volume 3. Using the IBM CICS Gateway for Lotus Notes*, IBM form number SG24-4512-00
- *Lotus Solutions for the Enterprise, Volume 4. Lotus Notes and the MQSeries Enterprise Integrator*, IBM form number SG24-2217-00, Lotus part number 12992
- *IBM PC Server and Lotus Domino Integration Guide*, IBM form number SG24-2102-01, Lotus part number 12970
- *Lotus Domino Server Release 4.5 on AIX Systems Installation, Customization and Administration*, IBM form number SG24-4694-01, Lotus part number 12969
- *Lotus Domino Server 4.5 on OS/390: Installation, Customization & Administration*, IBM form number SG24-2083-00, Lotus part number AA0963
- *Lotus Domino for S/390 Performance Tuning and Capacity Planning*, IBM form number SG24-5149-00, Lotus part number CT6XNIE

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